MEDICINE HISTORY TAKING

A.INTRODUCTION

1.NAME
2.AGE
3.RELIGION
4.SEX
5.FROM (Locality)
6.OCCUPATION

TYPICAL DESCRIPTION: Ramesh Das, 52 yr Hindu male from Cuttack, a farmer by occupation, presented to this hospital with chief complaints of (blood vomiting since 1 day)

B.CHIEF COMPLAINTS WITH DURATION

>Chief complaints are noted in **CHRONOLOGICAL ORDER along with the duration of each complaint**, recorded in pt's words i.e in the exact words in which pt describes his complaints, but not in medicine words, e.g. write scanty urination, but not oliguria. No **LEADING QUESTIONS** are asked at this stage.
>What are your complaints? Or what brings you here? & How long have you been suffering from each of these complaints?
>The disease is present for this much of period, then why do you come now?

>**CHRONOLOGICAL ORDER**-It means you have to mention first the symptom which appeared first & then the subsequent symptoms which appeared in succession of time i.e you have to mention the symptoms appearing in succession. For example, if a person has cough since 2 days, fever since 5 days & chest pain since 15 days, then you have to tell the chief complains in the following way-The pt has chest pain since 15 days, fever since 5 days & cough since 2 days. Never tell- The pt has chest pain for 15 days, fever for 5 days & cough for 2 days. That means you have to use the word **"since"** instead of **"for"**.

C.HISTORY OF PRESENT ILLNESS

a.When you are apparently well or asymptomatic?
b.How was the onset of illness? Or how did the trouble start?
c.In what chronological order the symptoms appeared?
d.How have the symptoms progressed or modified during the course of illness?
e.Any treatment & its result.The answers are recorded in pt's language (not in scientific terms). Leading questions must not be asked. For example, ask, "Does the pain ever move?" but do not ask, "Does the pain move to the shoulder?"
f.***IF SOME SYMPTOMS OF ONE SYSTEM ARE COMPLAINED BY THE PATIENT, YOU THEN ASK ABOUT THE OTHER RELEVANT SYMPTOMS(PERTAINING TO THE DISEASES YOU THINK OF AFTER LISTENING TO THE CHIEF COMPLAINTS) EVEN IF THESE SYMPTOMS ARE NOT COMPLAINED BY THE PATIENT.***
g.**LEADING QUESTIONS** are asked at this stage. Leading ouestions mean questions whose answers are to be given either in Yes or in No OR questions which yield only one answer. For example, if a pt is asked like this-"Does not the pain move to the inferior angle of the scapula?" Obviously, the pt will answer Yes or No. So the questions should be put in the way so that it leaves the pt with free choice of answers. For example, the above questions should be-"Does the pain ever move? If the pt says Yes, then ask-"Where does it go? So the questions should not necessarily be leading, but to help the pt to narrate the different aspects of his symptoms to arrive at a diagnosis.

CARDIO VASCULAR SYSTEM (CVS)

1.CHEST PAIN

1. Duration
2. Onset-Severe pain from the beginning/ mild pain to start with which then increased in severity
3. Progress-Stationary/ Improving/ Progressing-Rapidly/Slowly
4. Time of appearance-Early morning/Early night
5. Episodes
6. Site
7. Type
8. Radiation
9. Lasting
10. Aggravating Factors
11. Relieving Factors
12. Associated night sweats

2.PALPITATION

1. Duration
2. Onset-Severe from the beginning/ mild to start with which then increased in severity
3. Progress-Stationary/ Improving/ Progressing-Rapidly/Slowly
4. Rate-Fast/Slow
5. Irregular/Regular
6. Relieving Factors-Rest/Drug
7. Aggravating factors-Exertion/Exercise/ Straining
8. Passage of Urine after an Episode

3.BREATHLESSNESS (DYSPNEA)

1. Duration
2. Onset-Severe from the beginning/ mild to start with which then increased in severity
3. Time of appearance-Early morning/ Early night
4. Progress-Stationary/ Improving/ Progressing-Rapidly/ Slowly
5. Paroxysmal/ Exertional
6. How much exertion is needed
7. Preceeding events-Cough with expectoration
8. Associated events-Cough/ Chest pain/ Wheeze/ Stridor/ Shock / Fever/ Angina/ Palpitation/ Syncope/ Hypertension/ Cyanosis/ Wt loss
9. Grade-I/ II/ III/ IV
10. Orthopnea
11. Paroxysmal Nocturnal Dyspnea (PND)
12. Seasonal variation-Present/ Absent
13. Aggravating factors
14. Relieving factors-Drugs/ Rest/ Change of smoky environment/ Squatting/ Change of posture/ Expectoration

GRADE OF BREATHLESSNESS OR DYSPNEA

GRADE	CHARACTERISTICS

I	• No limitation of physical activity • No symptoms on ordinary exertion
II	• Slight limitation of physical activity • Ordinary activity causes symptoms
III	• Marked limitation of physical activity • Less than ordinary activity causes symptoms • Asymptomatic at rest
IV	• Inability to carry out any physical activity without discomfort • Symptomatic at rest

>There is no zero grade in dyspnea classification.
>In Grade-IV, the person is restricted to bed or chair.

4.COUGH

1. Duration
2. Onset-Severe from the beginning/ mild to start with which then increased in severity
3. Progress-Stationary/ Improving/ Progressive-Rapid/Slow
4. Expectoration
5. Seasonal variation-Present/Absent
6. Diurnal variation-Present/Absent
7. Aggravating fators-Present/Absent
8. Postural variation
9. Relieving factors-Rest/ Medicine

5.EXPECTORATION

1. Quantity-Scanty/Copious
2. Colour
3. Consistency-Mucoid/ Purulent
4. Foul smelling-Yes/ No
5. Blood staining-Yes/ No
6. Seasonal variation-Present/ Absent
7. Postural variation-Present/ Absent
8. Aggravating Factors
9. Diurnal variation-Present/ Absent
10. Relieving Factors-Rest/ Medicine

6.HEMOPTYSIS

1. Duration
2. Onset-Severe from the beginning/ mild to start with which then increased in severity
3. Progress-Stationary/ Improving/ Progressing-Rapid/ Slow
4. Episodes-1/ 2/ 3/ 4/
5. Fresh blood/ Altered blood
6. Aggravating factors
7. Relieving factors

7.SYNCOPAL ATTACKS

1. Episodes
2. Lasting
3. Relieving factors
4. Aggravating factors

8.CONVULSION

1. Type-Generalised tonic-clonic/ Absense
2. Duration
3. Progress
4. Episodes
5. Lasting
6. Relieving factors
7. Aggravating factors
8. Associated fever
9. Any froth
10. Whole body or one part of body
11. Tongue biting-Present/ Absent

9.EDEMA

1. Duration
2. Onset-Gradual(=Insiduous)/ Sudden
3. Progress
4. Site-Face/ Leg
5. Pitting/ Non pitting
6. Aggravating Factors-Oliguria
7. Relieving Factors-Diuretics

10.FEVER

1. Duration
2. Onset-Gradual (=Insiduous)/ Sudden
3. Type-
   - Continued
   - Remittent
   - Intermittent-Quotidian/ Tertian/ Quatran
4. Progress
5. Paroxysm-One/ Multiple
6. Grade-High/ Low
7. Chills/ Rigor
8. Diurnal Variation-How long the fever stays-
9. H/O convulsion
10. H/O drug intake
11. H/O any treatment received & its effect-

11.RENAL SYMTOMS-Oliguria/ Nocturia

12.TIREDNESS & FATIGUE (Fatigue on exertion)

13.MALAR FLUSH

RESPIRATORY SYSTEM

1.COUGH

1. Duration
2. Onset-Gradual(=Insiduous)/ Sudden
3. Progress
4. Episodes
5. Expectoration
6. Seasonal variation
7. Diurnal variation
8. Postural variation
9. Relieving factors-Rest/Medicine
10. Aggravating fators

2.EXPECTORATION

1. Duration
2. Onset-Gradual(=Insiduous)/ Sudden
3. Progress
4. Quantity-Scanty/ Copious
5. Amount____ml/day or____cups/day
6. Colour
7. Consistency
8. Foul smelling
9. Blood staining
10. Seasonal variation-Present/ Absent
11. Postural variation-Present/ Absent
12. Aggravating Factors
13. Diurnal variation-Present/ Absent
14. Relieving Factors-Rest/ Medicine

3.HEMOPTYSIS

1. Duration
2. Onset
3. Progress
4. Episodes

5. Fresh/Altered
6. Aggravating factors
7. Relieving factors

4.CHEST PAIN

1. Site-a.Localised-Retrosternal/ Lateral
   b.Generalised
2. Onset-Sudden/ Gradual
3. Character- Sharp & Stabbing/ Aching/
   Constipation
4. Effect of breathing & coughing-Worse/ Unrelated

5.BREATHLESSNESS (DYSPNEA)

1. Duration
2. Onset
3. Time of appearance-Early morning/ Early night
4. Progress-Stationary/ Progressive--Rapid/ Slow
5. Paroxysmal/ Exertional
6. How much exertion is needed
7. Preceeding events-Cough with expectoration
8. Associated events-Cough/ Chest pain/ wheeze/ Stridor/ Shock / Fever/ Angina/ Palpitation/ Syncope/ Hypertension/Cyanosis/Weight loss
9. Grade-I/ II/ III/ IV
10. Orthopnea
11. Paroxysmal Nocturnal Dyspnea (PND)
12. Seasonal variation-Present/Absent
13. Aggravating factors
14. Relieving factors-Drugs/ Rest/ Change of smoky environment/ Squatting/ Change of posture/ Expectoration

6.WHEEZING OR STRIDOR

1. Duration
2. Onset
3. Progress

7.FEVER

1. Duration
2. Onset
3. Type-
   - Continued
   - Remittent
   - Intermittent-Quotidian/ Tertian/ Quatran
4. Progress
5. Paroxysm-One/ Multiple
6. Grade-High /Low
7. Chills/ Rigor
8. Diurnal Variation-How long the fever stays-
9. H/O convulsion
10. H/O drug intake
11. H/O any treatment received & its effect-

8.HEAVINESS IN THE CHEST

1. Duration
2. Onset
3. Progress

9.HOARSENESS OF VOICE

1. Duration
2. Onset
3. Progress

10.SWELLING OF FEET

1. Duration
2. Onset
3. Progress

GASTROINTESTINAL SYSTEM (GIS)

1.ABDOMINAL PAIN

- Site
- Duration
- Onset-Gradual/ Sudden
- Time of onset (Timing)
- Character (Type)
- Progression
- Severity
- Frequency & Periodicity
- Movement of pain-Shifting/ Radiation/ Referal
- Lasting
- Aggravating factors-Food/ Vomiting/ Respiration/ Posture/ Micturition/ Jolting/ Walking/ Defecation/ Pressure
- Relieving factors-Food/ Vomiting/ Drug
- Associated Symtoms

2.ABDOMEN DISTENSION

- Duration
- Onset
- Progress
- Relieving factors
- Aggravating factors

3.DYSPHAGIA

1. Duration
2. Onset
3. Progress
4. More to-Solid/ Liquid
5. Aggravating factors
6. Relieving factors-Drug/ Lying down

4.VOMITING

- Duration
- Onset
- Progress
- Episodes
- Projectile
- Nausea
- Timing
- Relieving factors
- Aggravating factors

VOMITUS

- Amount
- Colour-Bilious/ Blood Stained
- Recent Food
- Foul Smelling

5.DIARRHEA

- Duration
- Onset
- Progress
- Episodes
- Timing
- Relieving factors-Drug
- Aggravating factors-Pain/ Food

MOTION

- Amount
- Colour
- Blood stained
- Mucous stained

- Solid/ Watery
- Tenesmus
- Foul smelling
- Floating in Pan

6.CONSTIPATION

- Duration
- Onset
- Progress
- Relieving factors-Drug
- Aggravating factors-Pain/ Food

7.SWELLING

- Duration
- Onset
- Progress
- Site
- Size
- Surface
- Skin over it
- Edge
- Extension

8.HEMATEMESIS

- Duration
- Onset
- Frequency
- Quantity
- Progress
- Colour-Bright red (fresh)/ Dark red (altered)
- Mixed with Food Particle
- Aggravating Factors
- Relieving Factors
- H/O Previous dyspepsia/ Upper GI bleeding
- H/O Alcohol abuse
- H/O Recent intake of corticosteroids/ NSAID
- Retching preceeding hematemesis
- Blood staining of the vomitus is apparent in first vomitus

9.EDEMA

- Site-Face/ Leg
- Duration
- Onset
- Progress
- Pitting/ Non-pitting
- Aggravating Factors-Oliguria
- Relieving Factors-Diuretic

10.JAUNDICE

- Duration
- Onset
- Progress
- Appetite
- Weight loss
- Urine Colour
- Stool Colour
- Skin Itching
- I.V Injection/ Tattooing/ Sexual intercourse
- H/O Drug abuse/ Alcohol intake
- H/O Blood Transfusion
- Associated with-Fever/ Chill & Rigor/ GI bleeding/ Abdominal pain/ Altered Bowel habit
- H/O travel & immunization-HBV/ HAV
- Aggravating Factors
- Relieving Factors

11.MELENA [TARRY i.e. STICKY BLACK STOOL]

- Duration
- Onset
- Frequency
- Quantity
- Progress
- Associated with straining
- Loose/ Semisolid
- Associated symptoms-Vertigo/ Dizziness/ Syncopal attack during defecation
- Aggravating Factors
- Relieving Factors

12.FEVER

1. Duration
- Onset
- Type-
  - Continued
  - Remittent
  - Intermittent-Quotidian/ Tertian/ Quatran
- Progress
- Paroxysm-One/ Multiple
- Grade-High /Low
- Chills/ Rigor
- Diurnal Variation-How long the fever stays
- H/O convulsion
- H/O drug intake
- H/O any treatment received & its effect

13.OLIGURIA

- Duration
- Onset
- Daily Amount
- Urine Colour
- Dysuria
- Hematuria
- Aggravating Factors
- Relieving Factors

14.RECTAL BLEEDING (HEMATOCHEZIA)

- Duration
- Onset
- Frequency
- Quantity
- Progress
- Colour-Bright red (fresh)/ Dark red (altered)
- Mixed with Food Particle
- Aggravating Factors
- Relieving Factors

15.ANOREXIA

- Duration
- Associated Weight loss

16.WEIGHT LOSS

- Duration
- Onset
- Progress
- Amount

17.BONE PAIN

- Duration
- Onset
- Progress
- Tenderness
- Aggravating factors
- Relieving factors

18.BLEEDING DIATHESIS

- Duration
- Onset
- Progress

* Rule out MALIGNCY--16, 17 & 18

19.FATIGUE/WEAKNESS

- Duration
- Onset
- Progress
- Aggravating factors
- Relieving factors
- Recent weight loss
- Muscle cramp

CENTRAL NERVOUS SYSTEM (CNS)

1.HIGHER FUNCTION

1. Altered Sensorium
2. Speech Disturbance
   - Dysarthria
   - Dyphasia
   - Dysphonia
3. Mental Symptom–Restlessness

2.CRANIAL NERVES

1. Sensation of smell-Normal/Abnormal
2. **a**.Distant vision- Able to read what is written on wall.
   b.Near vision-Able to read newspaper
   c.Color Vision-Able to see Red/ Blue/ Green
3. Any H/O Double Vision
4. Any H/O Squint
5. H/O Tingling/Numbness over the face/ Difficulty in Chewing
6. Facial Asymmetry/ Deviation of angle of mouth/ Dribbling of saliva/ Difficulty in drinking Water/ Loss of taste sensation
7. Vertigo/ Tinnitus/ Deafness
8. Hoarseness of voice
9. Nasal Twang/ Nasal intonation/ Nasal regurgitation
10. Difficulty in shrugging of shoulder
11. Difficulty in Talking (dysar thria)/ Wasting of tongue muscles
12. Difficulty in swallowing (Dysphagia)
13. Nasal regurgitation

3.MOTOR FUNCTION

A.WEAKNESS

1. Distribution-A few muscles/ A limb/ Both lower limbs (Paraparesis)/ Both limb on one side (Hemiparesis)
2. Type of weakness-UMN lesion type/ LMN lesion type
3. Evolution of weakness-Sudden & improving/ Gradually worsening over days or weeks/ Evolving over months or years

I.UPPER LIMB

1. Proximal Weakness

Difficulty in lifting the arm above the head/ Difficulty in Combing/ Difficulty in buttoning shirt/ Difficulty in eating/ Difficulty in Placing an object on a high self/ Difficulty in lifting objects

2. Distal Weakness

Difficulty in writing/Difficulty in sewing/ Difficulty in buttoning the shirt

II.LOWER LIMB

1. Proximal Weakness

Difficulty in squatting & getting up from squatting position/ Difficulty in Climbing upstairs & going downstairs/ Difficulty in running/ Difficulty in getting up from chair/ Difficulty in stepping on to a crub

2. Distal Weakness

Slippers slipping off the feet/ Inability to move upper limbs as well as lower limbs bed ridden or complete paralysis.

>Ask about the ability to stand (with or without support), walking (with or without support).

B.TONE-H/O of stiffness of the limbs

C.WASTING OF MUSCLES-Proximal/ Distal

D.COORDINATION

1. H/O unsteadiness of gait
2. H/O falling to one side [Cerebellar Ataxia]
3. H/O Inco-ordination in dark [Sensory Ataxia]
4. H/O involuntary movement-Unilateral/ Bilateral

E.GAIT

4.SENSORY SYSTEM

1. No H/O Tingling
2. No H/O Numbness
3. No H/O Root Pain
4. H/O Diminished or Absence of hot and cold sensa-tion while taking bath.
5. H/O not feeling the ground on walking or clothes on body.

5.SPHINCTER DISTURBANCE

1. H/O Difficulty in initiation of micturition
2. H/O Urgency (Difficulty in controlling micturition)
3. H/O Hesitancy
4. H/O Urinary retention
5. H/O Incontinence (Dribbling of Urine)
6. H/O Constipation/ Incontinence
7. H/O Sexual dysfunction/ Retrograde ejaculation

6.HEADACHE

1. Duration
2. Onset
3. Progressive
4. Site
5. Severity
6. Quality
7. Timing
8. Aggravating factors

9. Relieving factors
10. Associated migraine

7. **VOMITING**

1. Duration
2. Onset
3. Progress
4. Episodes
5. Projectile
6. Nausea
7. Timing

❖ **VOMITUS**
1. Episodes
2. Amount
3. Colour
4. Bilious
5. Blood stain
6. Recent Food
7. Foul Smelling

8. CONVULSION

1. Duration
2. Onset
3. Progress
4. Begin and end-Local/ Generalized
5. Fall
6. Hurt himself
7. Biting of tongue
8. Defecate during fit
9. After symptoms- Sleep/ Automatism/ Headache/ Paralysis
10. Subsequent mental disturbance
11. H/O Birth complication
12. H/O Ear discharge
13. H/O Recent or Remote head injury
14. H/O Similar attack in infancy

9. UNCONSCIOUSNESS

1. Duration
2. Onset
3. Progress
4. Age of first attack
5. Describe the attack
6. Second attack
7. Shortest/ Longest interval
8. Attack occurs during sleep
9. Any Premonitory symtoms or aura
10. Its Character-Loss of function [Paralysis]

10. BLURRED VISION

1. Duration
2. Onset
3. Progress

11. FEVER

1. Duration
2. Onset
3. Type-Continued/Remittent/Intermittent-Quotidian/ Tertian/Quatran
4. Progress
5. Paroxysm-One/Multiple
6. Grade-High/Low
7. Chills/Rigor
8. Diurnal Variation-How long the fever stays-
9. H/O convultion
10. H/O drug intake
11. H/O any treatment received & its effect-

12. PARALYSIS

1. Premonitory symptoms before onset
2. How did the paralysis come on [Describe]
3. Duration
4. Onset
5. Progress-Recovering/ Worsening
6. Site
7. Associated with vomiting
8. Symptoms of heart disease-Breathlessness/ PND/ Orthopnea
9. Symptoms of HTN [bluring of vision]
10. Symptoms of diabetes mellitus

13. DIZZINESS

1. Duration
2. Onset
3. Progress
4. Type–Intermittent
5. Worsen–Change in Head Position
6. Relieving factors
7. H/O Trauma
8. H/O Deafness

14. CEREBELLAR FUNCTION

1. Swaying/ Unsteadiness/ History of falling
2. Weakness
3. Giddiness

15. SYNCOPE

16. AMNESIA

17. SLEEP DISORDER

18. INVOLUNTARY MOVEMENTS

19. APHASIA

20. FOCAL DEFICITS

GENITOURINARY SYSTEM

1. SWELLING OF THE FACE

1. Duration
2. Onset
3. Progress
4. Aggravating factors
5. Relieving factors

2. SWELLING OF THE ABDOMEN

1. Duration
2. Onset
3. Progress
4. Aggravating factors
5. Relieving factors

3. SWELLING OF THE WHOLE BODY

1. Duration
2. Onset
3. Progress
4. Aggravating factors
5. Relieving factors

4. ALTERATION IN URINE VOLUME

a. SCANTY URINATION (=OLIGURIA i.e < 400 ml/24 hr)

1. Duration
2. Onset
3. Progress

b.NO URINATION (=ANURIA i.e no urination for last 12 hours)

1. Duration
2. Onset
3. Progress

c.INCREASED URINATION (=POLYURIA i.e > 3 litres/24 hr)

1. Duration
2. Onset
3. Progress

5.RED COLOR URINE (HEMATURIA)

1. Duration
2. Onset
3. Progress

6.FEVER

1. Duration
2. Onset
3. Type-
   - Continued
   - Remittent
   - Intermittent-Quotidian/ Tertian/ Quatran
4. Progress
5. Paroxysm-One/ Multiple
6. Grade-High/ Low
7. Chills/ Rigor
8. Diurnal Variation-How long the fever stays
9. H/O convulsionH/O drug intake
10. H/O any treatment received & its effect

7.LOIN PAIN

1. Duration
2. Onset
3. Progress

8.INCONTINENCE

9.DISCHARGE PER URETHRA

LYMPHORETICULAR SYSTEM

1.LYMPH NODE ENLARGEMENT

1. Duration
2. Which group 1st affected
3. Pain
4. Fever
5. Primary focus
6. Anorexia
7. Wt. loss
8. Pressure effects-Swelling of face & neck/ Edema & Venous congestion of lower or upper limb/ Dyspnea/
   Dysphagia

2.HEMORRHAGIC SPOTS

1. Site
2. Size
3. Number

3.BLEEDING DIATHESES

1. Epistaxis
2. Gum bleeding
3. Menorrhagia
4. Haemarthrosis
5. H/o prolonged bleeding

4.BONE PAIN

1. Duration
2. Onset
3. Progress
4. Aggravating factors
5. Relieving factors

5.JAUNDICE

1. Duration
2. Onset
3. Progress
4. Appetite
5. Weight loss
6. Urine Colour
7. Stool Colour
8. Skin Itching
9. I.V.Injection/ Tattooing/ Sexual intercourse
10. H/O Drug Abuse/ Alcohol intake
11. H/O Blood Transfusion
12. Associated with-Fever/ Chills & Rigor/ GI bleeding/ Abdominal pain/ Altered bowel habit
13. Travel&immunization history-HBV/ HAV
14. Aggravating Factors
15. Relieving Factors

6.FEVER

1. Duration
2. Onset
3. Type-
   - Continued
   - Remittent
   - Intermittent-Quotidian/ Tertian/ Quatran
4. Progress
5. Paroxysm-One/ Multiple
6. Grade-High/ Low
7. Chills/ Rigor
8. Diurnal Variation-How long the fever stays
9. H/O convultionH/O drug intake
10. H/O any treatment received & its effect

7.RECURRENT RESPIRATORY TRACT INFECTION

1. Duration
2. Onset
3. Progress

8.SORE THROAT

1. Duration
2. Onset
3. Progress

9.ANOREXIA

1. Duration
2. Onset
3. Progress
4. Associated Weight loss

10.WEIGHT LOSS

1. Duration
2. Onset
3. Progress
4. Amount

11.SWELLING IN THE ABDOMEN

1. Duration
2. Onset
3. Progress
4. Site
5. Size
6. Surface
7. Skin over it
8. Edge
9. Extension

LOCOMOTOR SYSTEM

1.PAIN & SWELLING OF JOINT (ARTHRITIS)

1. Duration
2. Onset
3. Progress
4. Aggravating factors
5. Relieving factors

2.ONLY PAIN IN JOINT (ARTHRALGIA)

1. Duration
2. Onset
3. Progress
4. Aggravating factors
5. Relieving factors

3.INVOLVEMENT OF

-Axial skeleton/Appendicular skeleton

4.INVOLVEMENT OF

-Large joints/ Small joints

5.MORNING STIFFNESS

- Absent
- Present

1. Duration
2. Onset
3. Progress
4. Aggravating factors
5. Relieving factors

6.MONO/ PAUCI/ POLY ARTICULAR

7.FLEETING/ ADITIVE

8.ASSOCIATED H/O

-Conjunctivitis/ Iritis/ Skin rash/ Skin nodule/ Mouth or penile ulcer/ Lymphadenopathy/
Alopecia/ Dry mouth/ Previous miscarriage

D.PAST HISTORY

GENERAL

1.Similar attack history in the past
2.No history suggestive of TB/ HTN/ Diabetes/ RHD/ IHD/ Jaundice/ H/O contact with persons suffering from TB or any contagious disease (or Pt is not a diabetic, not a hypertensive etc.)
3.Any Prolonged illness/Serious illness in the past
4.Immunisation history

SPECIFIC

1.CARDIOVASCULAR SYSTEM
2.RESPIRATORY SYSTEM
3.GASTROINTESTINAL SYSTEM
4.NERVOUS SYSTEM

1. MITRAL STANOSIS
2. CVA
3. HEMIPLEGIA
4. PARAPLEGIA

E.PERSONAL HISTORY

- Occupation
- Socioeconomicstatus-Poor/Average/High income
  status
- Marital status-Married/Unmarried/Widow/ Divorced/ Separated
- Dietary habit-
  1.Regular/Irregular/Fasting/Avg.Indian diet
  2.Vegetarian/Non-vegetarian
- Addiction
  1.Alcohol-a.Amount/ day- b.Duration-
  2.Smoking- a.Nos- b.Duration-
  3.Tobacco in any form
- Bowel
- Bladder
- Allergies

>**Tell that the pt is habituated to pan & addicted to alcohol. Do not tell pt is addicted to pan because, habituation means, if the pt does not take the habituated things, there will be no withdrawal symptoms. But in addiction, if the pt discontinues the addicted thing, he will develop withdrawal symptoms.**
>Menstrual history is to be told under personal history in female patients.

MENSTRUAL HISTORY

I.PRESENT CYCLE

a.Age of menarche
b.LMP (First day of the last normal menstrual period)
c.Duration of bleeding
d.Length of the cycle (It is the interval from the first day of one period to the onset of the next period)
e.Regularity of the cycle (Rhythm)-Regular/ Irregular
f.Associated clot
g.Associated pain

II.PREVIOUS CYCLES

a.Duration of bleeding
b.Length of the cycle (It is the interval from the first day of one period to the onset of the next period)
c.Regularity of the cycle (Rhythm)-Regular/ Irregular
d.Associated clot
e.Associated pain

*Mention about past menstrual history only if previous cycles are irregular. Otherwise tell-Previous cycles are regular.
>**Typical description**-Menstrual period is **2-3** days in a cycle of **28-30** days duration, regular, not

associated with pain & clot. OR Menstrual period is **2-3** days in a cycle of **28-30** days duration, regular & with average blood flow. (Average blood flow indicates it is not associated with clot)
>Clot in menstrual flow indicates heavy bleeding. It can also be determined by number of pads used.

F.FAMILY HISTORY

1.H/O similar symptoms/ disease in the family

G.TREATMENT HISTORY

1.Treatment received in the home, PHC, CHC & district head quarter

H.GENERAL EXAMINATION

>**YOU MUST STAND ON THE RT AIDE OF THE PT WHILE EXAMINING HIM. IF YOU ARE ON THE LT SIDE OF THE PT WHEN THE EXAMINER IS ASKING YOU SOMETHING, THEN YOU MUST COME TO THE SIDE OF THE RT SIDE OF THE PT & THEN DEMONSTRATE WHAT YOU ARE ASKED FOR.**
>**TELL IN THE SEQUENCE MENTIONED BELOW**

1.He is conscious & cooperative/ Uncooperative

2.BODY BUILT

-Average body built/ Chachexia
>Cachexia is characterized by combined manifestations of anorexia, anemia plus emaciation i.e a profound state of general ill health.
>Identification points of emaciation-
1.H/O polyphagia, polyuria (Diabetes mellitus), depre-ssion (Anorexia nervosa), irritability (Thyrotoxicosis), fevers (Tuberculosis).
2.See the facies-For exophthalmos, thyrotoxicosis
3.Palpate for lymphadenopathy-Tuberculosis, Malignan-cy
4.Examine for tremor-Thyrotoxicosis

3.DECUBITUS (Posture while lying on bed)

Dorsal decubitus (or of choice)/ Lateral decubitus/ Propped up/ Stooping forward/ Squating/ Hemiplegic decubitus / Lying still

HEMIPLEGIC DECUBITUS-The affected arms remains flexed, adducted & semipronated while the affected lower limb adopts extended, adducted & plantiflexed attitude. As a whole,the affected side shows less mobility while the Pt. is in bed.Normal lower limb is flexed & normal upper limb is extended. You may not tell this in examination.
*__TELL ONLY IN CASE OF HEMIPLEGIA.__

4.PALLOR

-Mild/ Moderate/ Severe
>Lower palpebral conjunctiva-Retract the lower eyelids downward & ask the Pt. to look upwards. See in both eyes at a time.
>Tongue-Specially the tip & the dorsum
>Soft palate
>Nailbeds-Press the pulp to see the redness of nail bed
>Palm (In anemia, palmar creases are lighter colored than surrounding area of hyperextended palm), soles & general skin surface
>The color of the tongue & the conjuctiva are more reliable than other sites in adults while in children, palms & soles are to be specially looked for.
>In scleroderma, due to symblepharon, you can not see pallor in eye since you can not retract the lower lid.
>**TELL THAT THERE IS MILD/ MODERATE /SEVERE PALLOR. DO NOT TELL THAT PALLOR IS PRESENT.**

5.ICTERUS

-Mild/ Moderate/ Severe

1.Mild-Only the conjunctiva is yellow
2.Moderate
3.Severe-Palm or sole & skin are yellow
>**SEE ICTERUS ONLY IN GOOD NATURAL DAYLIGHT.** Ask the Pt. to stand in front of an open window. Do not see icterus inside the room & in the night.
>First see in the upper bulbar conjunctiva-Sclera is examined by asking the Pt. to look down (look to his big toe of his feet) while you retract the two upper eyelids upwards simultaneously by thumbs.
>In case of conjunctivitis or muddy conjunctiva see mucous membrane of palate i.e both soft & hard palate (except in those who chew betel)-Ask the Pt. to open mouth & then see his palate.
>Icterus is best appreciated by inspecting the sclera under natural light.in fair-skinned individuals, yellow color of the skin is obvious.In dark-skinned individuals, the mucous membrane can demonstrate the jaundice.jaundice is rarely detectable if serum bilirubin level is less than **2.5mg/dl**, but may remain detectable below this level during recovery from jaundice because of protein & tissue binding property of bilirubin.
>Undersurface of tongue
>Soft palate
>In severe case, see the nailbed, skin, palm, soles etc. >In carotenemia, sclera turns yellow while the skin turns lemon or orange yellow.
>***Tell that there is mild/moderate /severe icterus. Do not tell that icterus is present.***

6.CYANOSIS

-Peripheral/ Central
>Sites to be looked for peripheral cyanosis (**in good natural light**)-Tip of the nose, ear lobules, outer aspect of lips, chin & cheek, tips of fingers & toes, palms & soles (Tongue remains unaffected).
>Sites to be looked for central cyanosis (**in good natural light**)-Tongue (Mainly the margins & the undersurface), inner aspect of lips, mucous membrane of gum, soft palate & cheeks, lower palpebral conjunctiva, Plus the sites mentioned in the peripheral cyanosis (one must examine these sites).
>In central cyanosis, both the central & peripheral areas are blue while in peripheral cyanosis, only the peripheral parts are blue.
>***Tell-No pallor, no cyanocis etc. Never tell-Pallor is absent, cyanosis is absent etc***.

7.JUGULAR VENOUS PRESSURE (ENGORGEMENT OF NECK VEINS)

NECK VEINS
1.Engorged/ Not engorged
2.If engorged-
  1.JVP is raised ____cm above the sternal angle
  2.Abdominojugular reflux-Positive/ Negetive

MEASUREMENT OF JVP

a.JVP is expressed as the vertical height from the zone of trasition of distended & collapsed internal jugular veins. The right internal jugular vein is selected because it is larger, straighter & has no valves. It is situated between two heads of the sternomastoid.

b.Positioning pt while measuring JVP

Usually the pt is made to lie in a reclined position at an angle of 45 degree woth the bed. Then the level of venous engorgement of jugular vein in relation to the sternal angle is measured with the help of two plastic rulers-One ruler is placed vertically over the sternal angle while the other ruler is placed horizontally from the top of the oscillating venous coloumn upto the first ruler (the two ruler are held perpendicular to eachother). The point at which the two ruler meet is marked & the vertical distance from this point to the sternal angle is measured which is expressed as JVP in cm above the sternal angle. ***In general, for positioning the patient, the lower the pressure in the venous system, the more supine the patient's position should be;the higher the pressure, the more vertical (upright) the pt's positon should be.***

c.When the JVP is grossly elevated, the jugular vein may be engorged right upto the angle of the jaw even when the patient sits up. Add **5** with JVP value to get mean right atrial pressure in terms of centimeters of blood which can be converted to mm of Hg by multiplying 0.736.

d.*If JVP is highly raised and could not be measured, then tell, "JVP is raised beyond the angle of the mandible OR Upper boder of jugular venous pulsation is not seen".*

ABDOMINOJUGULAR REFLUX=HEPATOJUGULAR REFLUX

In a pt suspected of right ventricular failure who has normal CVP at rest, the abdominojugular reflux test may be helpful. Turn the pt's head toward the lt side to expose the rt jugular vein. The palm of the examiner's rt hand is placed over the abdomen & firm pressure is applied in the periumbilical area for 10 s or more while the examiner looks at the rt jugular vein. In normal persons, this maneuver does not alter the JVP significantly i.e. JVP rise transiently for < 15 s by < 4 cm & falls down even when pressure is continued. But when the rt heart function is impared, the upper level of the venous pulsation usually increases. A positive abdominojugular test is best defined as an increase in JVP during 10 s of firm midabdominal compression followed by a rapid drop of pressure of 4 cm blood on release of the compression. The most common cause of a positive test is right sided heart failure secondary to elevated left heart filling pressure. Abdominojugular reflux is positive in right or left heart failure and/or tricuspid regurgitation. In the absence of these conditions, a positive abdominojugular reflux suggests an elevated pulmonary artery wedge pressure or central venous pressure. It is negative in Budd-Chiari syndrome.

IMPORTANCE OF ABDOMINOJUGULAR REFLUX

1. To diagnose incipient (early stage) right heart failure (CCF)
2. To differentiate between arterial & venous pulsation
3. To differentiate between obstructive & nonobstructive causes of engorged neck vein (Negative abdomin-ojugular reflux is seen in SVC syndrome & Budd-Chiari syndrome)

>During examination of the neck veins (Jugular vein) in the examination, always ask for the backrest. If backrest is not supplied, then support the patient's trunk on your left arm to make an angle of 45^0.
>Normal JVP is **3-5 cm** above the sternal angle (with the Pt. at 45^0 to horizontal.)
>Engorgement of veins in the neck is a striking feature of CHF.

KUSSMAUL'S SIGN (=VENOUS PULSUS PARADOXUS)

In severe CCF & normally healthy persons, the jugular venous pressure falls on deep inspiration due to suking of the blood into the right atrium. Reverse happens after deep expiration. But in constrictive pericarditis, pericardial effusion or right ventricular infarction (or severe right sided heart failure), there is paradoxical rise in JVP after deep inspiration due to nonaccomodation of increased venous return into the right side of the heart. This is called as Kussmaul's sign & is also known as venous pulsus paradoxus. So **KUSSMAUL'S SIGN** is An increase rather than the normal decrease in the CVP (i.e JVP) during inspiration. In otherwords, *engorgement of jugular vein increases during inspiration & decreases during expiration.* **KUSSMAUL'S SIGN** is frequently found in constrictive pericarditis or rt ventricular infarction.

8.LYMPH NODE ENLARGEMENT

Cervical/ Axillary/ Inguinal/ Popliteal/ Epitrochlear/ Para-aortic
1. Site
2. Temperature
3. Tenderness
4. Number
5. Size
6. Shape
7. Extent
8. Surface
9. Margin-Discrete/Confluent
10. Consistency (Palmar aspect of three fingers)-Soft/ Elastic & rubbery/ Firm, discrete & shotty/ Stony hard / Variable/ Hard/ DiscreteMobility-Movable/ Fixed
11. Fixity to surrounding skin-Yes/ No
12. Matting-Present/Absent
13. Examination of draining LNs
14. Examination of LNs in other parts of body

>Lymphadenopathy=Adenopathy

SIGNIFICANT LYMPHADENOPATHY

It means lymph node size **> 2 cm** in inguinal region & **>1 cm** in other region.

LOCALISED LYMPHADENOPATHY (=REGIONAL LYMPHADENOPATHY

Involvement of lymphnode of a single anatomic area.

GENERALISED LYMPHADENOPATHY

Involvement of three or more noncontiguous lymph node areas.

9.THYROID SWELLING

1.No Thyromegaly
2.Thyromegaly
  1.Size-
  2.Shape-
  3.Thrill over the thyroid-Present/ Absent

10.CLUBBING(=LOVIBOND'S SIGN)

1.Unilateral/ Bilateral
2.Unidigital/ Multidigital
3.Painful/ Painless
4.Drum stick type/ Parrot beak type
5.Onychodermal angulation-Intact/ Lost
6.Fluctuation test-Positive/ Negative
7.Degree of clubbing-1st /2nd / 3rd
8.Central cyanosis-Present/ Absent
9.Dyspnea-Present/ Absent

DEGREE OF CLUBBING

1. FIRST DEGREE

Increased fluctuation of the nailbed with loss of onycho-dermal angle.

2. SECOND DEGREE

First degree + increase in anterop-osterior & transverse diameter of the nails.The nails become smooth & glossy with loss of longitudinal ridges.

3. THIRD DEGREE

Second degree + increased pulp tissue

4. FOURTH DEGREE

Third degree + swelling of wrist & ankle due to hypertrophic osteoarthropathy(HOA).

HYPERTROPHIC OSTEOARTHROPATHY (HOA)

It is a painful swelling of the wrist, elbow, knee & ankle with radiographic evidence of subperiosteal new bone formation. It can be familial or idiopathic. Other common disorders that produce it are
a.Bronchogenic carcinoma
b.Cystic fibrosis
c.Neurofibroma
d.Arteriovenous malformations
>When examining a pt for clubbing, always look for any swelling of wrist or ankle. If wrist & ankle are swollen, then clubbing is of fourth degree.
>Tell only clubbing present or absent. Do not mention about Drumstick type/ Parrot beak type.

EXAMINATION OF CLUBBING

A.First step-Bring the Pt's finger at your eye level & look tangentially. Observe the onychodermal angle. If the angle is 180^0 or more, it is said that clubbing is present. **Onychodermal** angle is the angle formed between the nail & nailbed. It is also known as **Lovibond's angle**. The normal onychodermal angle is approximately **160^0** . Clinically onychodermal angle is judged by the angle formed between the nail & adjacent skinfold. Thus the other name of clubbing is **Lovibond's sign**.

B.Very early clubbing can be detected by increase in fluctuation of the nailbed i.e fluctuation is the very early sign of clubbing. To elicit fluctuation, Pt's finger (say the middle finger) is placed on the pulp of the examiner's two thumbs (with palmar aspect of the thumbs facing upward) & held in this position by gentle pressure applied with the tips of the examiner's middle fingers of both hand on the Pt's proximal interphalangeal joint. Now the nail base of the Pt's finger is palpated by the tips of the examiner's two index finger of both hand & observe for fluctuation. There is always some amount of fluctuation present in normal fingers. When fluctuation is obvious due to clubbing, palpation of the nailbed may give the impression that the nail is floating on its bed.

C.Place the nails of the two identical fingers (preferably ***THUMBS OF TWO HANDS***) face to face & look for the diamond shaped area formed between the two nails & the proximal nail folds. The normally formed diamond shaped area is obliterated in the presence of clubbing. This is known as ***SCHAMROTH'S SIGN.***

>*For detection of clubbing, first examine the onychodermal angle & then the fluctuation.*

D.PROFILE SIGN

Definite firm transverse ridge at the root of the nail best observed on the dorsal aspect of the fingers**.**

>MOST RELIABLE EARLY SIGN OF CLUBBING IS THE LOSS OF NORMAL ONYCHODERMAL ANGLE.

>Most reliable early sign of clubbing is loss of onychodermal angle. The earliest sign of clubbing is increased fluctuation of nailbed though not always reliable.
>Usually the thumb & index fingers are affected first in clubbing. Clubbing first appears in the index finger. The minimum duration required for clubbing to manifest is 2-3 weeks.
>After examination of one hand for clubbing, examine the other hand & next examine the toes.
>Clubbing within 24 hrs occurs in Empyema Thoracis.

11.KOILONYCHIA

>Bring the Pt.'s fingers at your eye level & look tangentially (as you do in clubbing). Observe & palpate the nail plates for any flattening or spooning. Tell when present. Otherwise, don't tell.
>Koilonychia is a spoon-shaped deformity of the nail usually found in chronic iron deficiency anemia. Koilonychia develops as a result of retarded growth of the nail plate.

STAGES OF KOILONYCHIA

1.**FIRST STAGE**

Stage of brittleness, where the nail becomes brittle & rough.

2.**SECOND STAGE**

Stage of flattening, where the nail is thin, flat & without longitudinal ridges.

3.**THIRD STAGE**

4. Stage of spooning, where the nail becomes concave.

12.EDEMA OF DEPENDENT PARTS

1. Site-Face/ Leg
2. Bilateral/ Unilateral
3. Pitting/ Non pitting

>Edema is seen at the following places-Apply firm pressure for few seconds **(at least for 30 seconds)** by the tip of the right thumb sequentially over the dorsum of foot, medial malleolus, above the medial malleolus, medial surface of the lower end of the tibia. Now inspect & palpate the area for any depression. Do the same manoeuvre on the opposite side. Then turn the Pt to Lt. lateral or prone position & press the tip of right thumb over sacrum. **SACRUM MUST BE EXAMINED IN ALL PATIENTS WITH EDEMA.** Sacral edema is found in prolonged bed ridden pt.

EXAMINATION FOR PARIETAL EDEMA

Edema of the parieties (eg.abdominal wall) is assessed by pinching the skin at the flanks with rt thumb & rt index finger for few seconds **(AT LEAST FOR 5 SECONDS)**. [Other methods- Press the diaphragm of the stethoscope or the tip of fingers on the abdominal parieties or thigh for a few seconds (AT LEAST FOR 5 SECONDS) & look for pitting edema there.]

>Edema can be recognised by the pallid (i.e pale) & glossy appearance of the skin over the swollen part, by its doughy feel & by the fact that it pits on finger pressure.
>Observe carefully for **puffy face, puffy lower lids & scrotal edema**. Edema may be seen over sternum & forehead in a case of anasarca.

1. **PRETIBIAL**-Press over medial surface of the lower end of the tibia

2. **PEDAL**-Press over dorsum of foot.

3. **PRESACRAL**-Press over sacrum in left or right lateral position in prolonged bed ridden patient.

>In case of bilateral leg edema, ask the pt on which leg edema appeared first.
>**Whenever there is bilateral pitting pedal edema, do not tell about sacral edema. You will search for & tell about sacral edema only when there is no appreciable edema in lower limbs.**

13.CONDITION OF SKIN

1.Scratch marks
2.Spider angioma (=Spider nevus)
3.Palmar erythema
4.Purpura/ Ecchymoses
5.Scabies/ Pyoderma/ Impetigo
6.Loss of skin turgidity & elasticity
7.Erythema nodosum/ Folicular hyperkeratosis/ Xanthoma/ Colour/ Texture/ Skin rash/ Nodules/ Pigmentation/ Eczema/ Neuroectodermal dysplasia/ Nevi

>Tell when above features are present. Otherwise, don't tell. Scratch marks are found in case of obstructive jaundice & loss of skin turgidity occurs in dehydration.

>Skin changes in Kwashiorkor-Pigmentation, thickening, erythema, cracks, desquamation, & ulcers. Skin changes are classically seen on the legs, buttocks, perineum & extensor surfaces. In moderate cases, there is a special type of dermatosis known as crazy pavement skin.

14.CONDITION OF

a.HAIR

1. Color
2. Texture
3. Strength-Strong/ Brittle
4. Loss of body hair
5. Hirsutism-Present/ Absent

HAIR CHANGES IN PROTEIN-ENERGY MALNUTRITION

In kwashiorkor, the hair becomes fine, brittle, straight, lustureless & sparse. There are varieties of pigmentary changes from brown to grey to blonde type. Often there is a pale band across the black hair & is known as **flag sign**. In marasmus, modified hair texture is found.

>In SLE, there is loss of hair (i.e alopecia is seen)

b.NAIL

-Clubbing/ Flattening or koilinychia/ White nail or Leuconychia/Splinter hemorrhage/Transluscent bands
>Tell when present. Otherwise, do not tell. In SLE, there is loss of hair i.e alopecia is found.

15.TONGUE

-Glossitis/ Papillary atrophy/ Ulcers/ Dry
1. Dry tongue-Dehydration, atropine administration, mouth breathing
2. Pale tongue-Anemia
3. Bald tongue-There is total loss or atrophy of papillae & is classically seen in pellagra, pernicious anemia & iron deficiency anemia.
4. Angry looking tongue-It has central coating with red tip & margins classically seen in enteric fever.

*Tell when present. Otherwise, do not tell in the exam.

16.ANGLE OF MOUTH

-Angular stomatitis/ Cheilosis
*Tell when present. Otherwise, do not tell.
>Riboflavin deficiency- Glossitis, angular stomatitis & cheilosis.
>Look for angular stomatitis and cheilosis in case of anemia hypoproteinemia.
>Angular stmatitis & glossitis is found in deficiency of iron, folate, vit B_{12}, vit B_2 & niacin deficiency.
>Angular stomatitis refers to cracking of the epithelium at the edges of the lips & is caused by deficiency of iron, riboflavin, pyridoxine, niacin & herpes labialis at the angle of the mouth. Angular stomatitis is associated with the cheilosis in niacin deficiency & Pellagra.

17.OTHERS

a.BITOT'S SPOT

-Present/ Absent

>Ask the patient to look medially. Look for the Bitot's spot on the bulbar conjunctiva in the palpebral fissure. Bitot's spot are frequently bilateral.
*Tell when present. Otherwise, do not tell.
>Look for Bitot's spot in case of anemia hypoprotein-emia.
>Vitamin A deficiency-Bitot's spot & follicular hyperkera-tosis.

b.XANTHELESMA

c.PAROTID SWELLING

d.GYNECOMASTIA

When the disc size of the breast is more than the areola or the diameter of the disc is > **4 cm**. It is commonly found in CHF pt (due to MS or congenital heart disease) taking digitalis for a prolonged period.

e.SPIDER NAEVI

19.VITALS (Do not utter the word vitals in the exam.)

A.PULSE

a.RATE

-____ bpm (Radial artery)

1. Tachycardia- >**100** bpm
2. Bradycardia- < **60** bpm

>Normal pulse rate is **60 -100** bpm
>*Always count the beats for not less than **30 SECONDS**, but in arrhythmia count for full **1 MINUTE**.*
>**While describing the pulse rate, tell only in the even number.**

METHOD OF EXAMINATION OF PULSE

The radial pulse at the wrist is generally examined with the pulp of three fingers (index, middle & ring fingers). The pt's forearm will be semipronated & the wrist is slightly flexed. The rate & rhythm is better palpated in the radial artery while volume of the pulse is better palpated in the carotid artery, as it is the nearest pulse to the aorta.

PROPORTIONATE TACHYCARDIA

Rise in temperature by 1^0 F raises the pulse rate by 10 bpm.

DISPROPORTIONATE TACHYCARDIA

Rise in temperature by 1^0 F does not raises the pulse rate by 10 bpm i.e rise in temperature by 1^0 F raises the pulse rate by either >10 bpm or < 10 bpm.

RELATIVE TACHYCARDIA

Pulse rate rises **>** 10 bpm per degree (F) rise of temp.Usually to calculate relative tachycardia, normal pulse rate is taken as 72 bpm.

RELATIVE BRADYCARDIA (TEMPERATURE-PULSE DISSOCIATION)

Pulse rate ls raised by **<** 10 bpm per ^{0}F rise of temp. Usually to calculate relative bradycardia, normal pulse rate is taken as 72 bpm.

>Shock is defined as pulse rate 100 bpm & SBP **<**100 mm of Hg.

b.RHYTHM

(Spacing of successive beats in time in Radial artery)
1. Regular
2. Irregular
   1. Regularly irregular-Irregularity comes at regular intervals
   2. Irregularly irregular or completely irregular-Irregul-arity between two pulses beats in every aspect i.e. volume, spacing etc. i.e totally chaotic.

>**Whenever you are finding irregular pulse, you must count the pulse deficit & tell.**

PULSE DEFICIT = APEX-PULSE DEFICIT

It is the difference between the heart rate & the pulse rate when counted simultaneously for full 1 minute. But for our convenience, we determine pulse deficit in two minutes. First count the heart rate for 1 minute using the diaphragm of the stethoscope placed over the mitral area & then count the pulse rate for 1 minute in radial artery. Then findout the difference between the two rates. If pulse deficit is > 10 bpm, it is due to atrial fibrillation (AF). If pulse deficit is < 10 bpm, it may be due to multiple ectopics or atrial fibrillation. If pulse rate is **>**100 bpm & pulse defict **>** 10 bpm, atrial fibrillation is confirmed. If pulse rate is < 100 bpm, it may be due to atrial fibrillation or multiple ectopics.
>Pulse deficit is commonly found in atrial fibrillation & multiple ectopic beats.

c.VOLUME [Carotid artery (Right)]

- Good Volume (Tell in a normal case)
- High Volume ***(Pulse pressure > 60 mm of Hg)***
- Low Volume ***(Pulse pressure < 30 mm of Hg)***

d.CHARACTER [Carotid artery (Right)]

Normal/ Bounding/ Collapsing or Water hammer Pulse/ Plsus alternans/ Pulsus bigeminus/ Pulsus paradoxus/ Bisferiense pulse

>*The rate & rhythm are better palpated in **RADIAL ARTERY** while volume & character in **CAROTID ARTERY** (it is the nearest pulse to the aorta).*
>Usually palpation of peripheral arterial pulses such as radial artery gives less information than examination of a more central pulse (carotid pulse) regarding alterations in left ventricular ejection or aortic valve function. However, certain findings like Bisferiens pulse of AR or pulsus alterans are more evident in peripheral arteries.

e.RADIO–FEMORAL DELAY/ RADIO-RADIAL DELAY

-Present/ Absent
>For detection of Radio-Femoral delay, one should palpate the radial & femoral artery simultaneously by placing the left hand fingers on the right radial artery & right hand fingers on the right femoral artery. Conditions having radio-femoral delay are Coarctation of aorta.
>Radio-Radial delay-Simultaneously palpate both the radial arteries by both of your hands, using your lt hand for patient's rt hand & your rt hand for pt's lt hand. Conditions having radio-radial delay are Subclavian artery thrombosis, Raynaud's phenomenon.

f.CONDITION OF ARTERIAL WALL

-Arterial wall is just palpable (in normal case)/ Thickened (Arteriosclerosis in old age)

METHOD TO ASSESS THE CONDITION OF THE ARTERIAL WALL

First place the index & middle fingers of both the Lt. hand & Rt. hand over the radial artery side by side & exsanguinate the artery by moving the two middle fingers in opposite direction. The radial artery is now rolled over the radius by two index fingers.

g.SYMMETRY

Check out whether the same pulse on both the sides are palpable with equal magnitude or not. All peripheral pulses are palpable & equally felt on both sides. You must describe this point always. It includes the pulses of both upper & lower limbs.

>In case of edema, press the edema fluid for a few seconds for better palpation of peripheral pulses.

DEMONSTRATION OF WATER HAMMER PULSE (=COLLAPSING PULSE)

Water hammer pulse is best felt in the radial artery with the pt's arm elevated. Stand on the rt side of the pt. Grasp the pt's rt forearm just below the wrist joint with your rt hand in such a way that the palmar aspect of the head of the metacarpals overlie the radial artery & rest of the palm lies over the ulnar artery. Examine the volume of the pulse for a few seconds. Now elevate the whole upper limb (with support at the elbow to prevent flexion) suddenly above the shoulder & try to feel any changes in the volume of the pulse.For examination of the pulse in this way,the examiner stands within the angle formed between the Pt's body & the said upper extremity. The rt sided pulse should be examined by the rt hand while standing on the Rt. side & the lt sided pulse should be examined by the lt hand while standing on the lt side. If water hammer pulse is present, the pulse volume increases from the basal level (i.e the volume before elevating the upper limb at the beginning of the examination before elevating the upper limb) after elevation of the upper limb. The pulse strikes the palpating finger with a rapid *forceful jerk* & quickly disappears. The term collapsing pulse is used because the artery completely empties between the two beats giving an impression to the palpating palm that the pulse has collapsed. The collapsing nature is often reliably detected by palpation of the carotid artery.The upper limb is elevated during the examination, because-

1. When the upper limb is elevated, there is fall of blood coloumn resulting in vasodilation & thus helps to reduce the diastolic blood pressure more, so that the pulse pressure **(i.e SBP-DBP)** widens. More is the pulse pressure, betrer is the water hammer pulse felt.
2. When the upper limb is elevated, the radial artery palpated becomes more in the line of the aorta thereby allowing direct systolic ejection of blood into the radial artery during systole & direct diastolic backward flow of blood from the radial artery during diastole.

>***WATER HAMMER PULSE IS CHARACTERIZED BY: HIGH VOLUME & SHARP RISE*** **(large bounding pulse) and *ILLSUSTAINED & SHARP FALL.*** High volume is due to increased stroke volume. The stroke volume is increased because the left ventricle gets blood from two sources i.e *blood leaking* from the aorta & the blood from the left atrium. Sharp rise is due to decrease in the peripheral vascular resistance. The peripheral vascular resistance decreases because the increased stroke volume & hence the increased cardiac output stimulates the baroreceptors in the aortic arch causing reflex vasodilation which in turn decreases the peripheral resistance. Illsustained & sharp fall i.e collapse occurs because-1. Blood leaks into the left ventricle from the aorta during diastole (i.e Aortic run off), 2. Rapid run off of blood to the periphery from the palpated artery due to low peripheral vascular resistance explained earlier.

>Diastolic pressure can not be felt while palpating for Water hammer pulse. **PRESENCE OF WATER HAMMER PULSE IS CONFIRMED BY SPHYGMOMANOMETER BY MEASURING PULSE PRESSURE (I.E SBP-DBP) WHICH IS USUALLY GREATER THAN AT LEAST 60 mm OF Hg.**

METHODS TO PALPATE PERIPHERAL PULSES

PRINCIPLE : The arterial pulse is to be felt by compressing the concerned artery against a bony prominence.

A.HEAD & NECK

1.COMMON CAROTID ARTERY

- Use lt thumb for rt carotid artery & rt thumb for lt carotid artery. Place the pulp of the thumb between the thyroid cartilage (Upper border of thyroid cartilage) & the anterior border of sternomastoid muscle. Press the thumb gently backwards (against the **CAROTID TUBERCLE** of the **6th** vertebra) to feel the pulse.
- Examine for **volume, character & bruit in carotid artery.**

2.SUPERFICIAL TEMPORAL ARTERY

- Feel the artery with the pulp of the fingers just in front of the tragus of the ear.
- Tortuosity of this artery is a feature of atherosclero-sis.

3.FACIAL ARTERY

- Feel the artery on the mandible at the antero-inferior angle of the masseter.

B.UPPER LIMB

1.RADIAL ARTERY

- Wrist is slightly flexed & forearm is semipronated. Feel at the wrist on its volar (=ventral) aspect on the lateral side with the pulp of three fingers i.e index, middle & ring finger.
- Examine for **rate & rhythm in radial artery.**

2.BRACHIAL ARTERY

- Place the thumb in the antecubital fossa in front of the elbow (rt thumb for rt arm & lt thumb for lt arm.) Feel the artery with the pulp of the thumb just **medial** to the **biceps tendon**.

- **LOCOMOTOR BRACHIALIS**

  It is a feature of atherosclerosis. For demonstration, flex the upper limb at the elbow & externally rotate the flexed upper limb at the shoulder. Look for the tortuous pulsating Brachial artery at the inner (medial) side of the upper arm.

3.SUBCLAVIAN ARTERY

- Feel just above the middle of the clavicle with the pulp of the fingers.

C.LOWER LIMB

1.DORSALIS PEDIS ARTERY

- Feel at the middle of the dorsum of the foot just lateral to the tendon of extensor hallusis longus. Best felt at the proximal extent of the groove between the first & second metatarsus.
- It is absent in 10% of cases & is abnormally located in 10% of cases.

2.POSTERIOR TIBIAL ARTERY

- Feel 2cm below & 2cm behind the medial malleolus.

3.ANTERIOR TIBIAL ARTERY

- Feel at the lower end of the tibia just above the ankle joint & just lateral to the tendon of extensor hallusis longus which is made taut by asking the patient to extend his great toe.

4.POPLITEAL ARTERY

- **Preffered method**-Flex the knee to 40^0 (or 30^0) & make sure the pt is relaxed. Place the thumbs of both the hands in front of the knee & place other fingers of both the hands behind the knee in the lower part of the popliteal fossa. Press firmly & move the pulp of the fingers side to side against the posterior aspect of tibia in the lower part of the popliteal fossa (Feel the pulse 3-4cm below the knee crease). Popliteal artery lies on the **lateral side** of the lower part of the popliteal fossa.
- **Alternative method**-Patient lies in prone position. Feel the artery with the pulp of the fingers after flexing the knee passively with another hand.

5.FEMORAL ARTERY

- Patient lies in supine position. Feel the artery with the pulp of the fingers in the groin just below the inguinal ligament midway between the anterior superior iliac spines & the symphysis pubis (i.e mid-inguinal point). In obese patient, it is difficult to feel the femoral artery pulsation.

- Examine for **RADIO-FEMORAL DELAY & BRUITS IN FEMORAL ARTERY.**

GRADING OF PULSES

	TRADITIONAL	BASIC
4+	Normal	
3+	Slightly reduced	
2+	Markedly reduced	Normal
1+	Barely palpable	Diminished
0	Absent	Absent

B.BLOOD PRESSURE

a._____mm Hg
>Do not tell blood pressure is x mm of Hg in right arm in supine position, because it is assumed that you measured blood pressure in right arm in supine position.

METHOD TO MEASURE BLOOD PRESSURE IN UPPER LIMB

Follow the following steps

1. Pt should lie in supine position (as SBP may rise after sitting or standing) with the legs uncrossed & should take rest for 5 minutes before recording blood pressure at that position (BP should be recorded with the pt taking rest in a comfortable position & thus casual recording should always be avoided).

2. First remove the tight clothing from the upper arm. Wrap the cuff firmly & uniformly over the upper arm in such a way that it allows only enough room for **one finger** to be slipped between the cuff & skin surface. The lower border of the cuff should remain at least **1 inch** above the elbow joint. Use cuff of appropriate size i.e the cuff must encompass more than **two-thirds** of the upper arm. An ideal cuff should cover **two-third** of arm circumference. The cuff must be placed at the heart level to obtain a pressure that is uninfluenced by the gravity. Cuff size refers only to dimensions of the bladder or the inflatable pneumatic cavity of the cuff & does not refer to the entire cuff. The proper cuff size needed is determined by the dimensions of the limb that is used to measure the blood pressure. The ratio of the width of the cuff to the circumference of the extremity is of critical importance for accurate blood pressure measurement.

3. The arm should be kept in extended position & should be held at the level of the right atrium (Support the upper arm at the level of the heart). Keep the blood pressure instrument at the level of the pt's heart. Raise the pressure to **30 mm** of Hg above the point at which radial pulse disappears. Now start deflating at a rate of **2 to 3 mm/second** & the point of reappearance of the radial pulse indicates SBP by palpatory method.

4. Now place the diaphragm of the stethoscope over the brachial artery a little below the cuff (Auscultatory method). The cuff is inflated again & the mercury coloumn is raised to 20 mm of Hg above the SBP recorded by palpatory method. Then lower the mercury coloumn slowly at **2 mm/second**.

5. During deflation, Korotokoff sounds having following phases are heard
   1. **Phase I**-Sudden appearance of the faint, clear, tapping sound which indicates SBP.
   2. **Phase II**-Murmurs or swishing like sounds replace the tapping sound
   3. **Phase III**-Gong or Crisper sound which is more intense than murmur replaces murmur

4. **Phase IV**-Loud sound suddenly becomes muffled (i.e distinct, abrupt muffle of sound)
5. **Phase V**-Absence of all sounds which indicates diastolis blood pressure in adult & in pre-eclamsia.

6. Read BP to the **nearest 2 mm of Hg**. Two readings should be performed at least one minute apart.
7. Onset of phase-I Korotokoff's sound corresponds to systolic blood pressure.
8. In adult, the DBP should be recorded at Korotokoff phase V (i.e disappearance of sounds) & not phase IV (muffling of sounds). In children, the DBP should be recorded at Korotokoff phase IV (i.e muffling of sounds)
9. Muffling of sound i.e phase –IV sound is recorded as diastolic blood pressure when diastolic pressure is found to be zero.
10. Take two measurements at each visit. Repeat measurement after 5 minutes of rest if the first recording is high.
11. Standing blood pressure should be measured in elderly subjects, diabetics & those who are suffering from postural hypotension.
12. Postural hypotension is defined as a drop in systolic pressure of greater than equal to 20 mm of Hg on standing from the supine position i.e SBP in supine position – SBP in standing position ≤ 20 mm of Hg suggests postural hypotension.
13. To avoid spuriously high recordings in obese pt, the cuff should contain a bladder that covers at least 2/3rd of the circumference of the upper arm.
14. Blood pressure is usually measured in the rt arm with the pt lying on her side at 30 degree to the horizontal. In the OPD sitting posture is preffered. In either case the occluded brachial artery should be kept at the level of heart.

>***BLOOD PRESSURE SHOULD BE MEASURED IN ALL CARDIOVASCULAR CASES.***

METHOD TO MEASURE BLOOD PRESSURE IN LOWER LIMB

Pt lies in prone position. Tie the sphyg-momanometer cuff in the mid-thigh. Put the diaphragm of stethoscope in the popliteal fossa over the popliteal artery after feeling the popliteal artery pulsation.
>Recording lower limb blood pressure is important in coarctation of aorta (low), aortic regurgitation (high) etc.

AUSCULTATORY GAP (SILENT GAP)

During manual measurement of blood pressure in hypertensive individuals, the Korotkoff sounds sometimes disappear at a pressure well above the true diastolic blood pressure, then reappear at a lower pressure & again disappear at a further lower pressure ultimately indicating true diastolic pressure (Normally, Korotkoff sounds do not disappear at a pressure well above the diastolic pressure). This interval of pressure within which Korotkoff sounds are not heard is called as ausculatory gap. Improper interpretation of this gap leads to falsely low recording of systolic blood pressure because this gap which usually occurs at a very high pressre can be mistaken for the disappearance of Korotkoff sounds at a pressure greater than true systolic blood pressure **except that the pulse can still be palpated**. That is why, it is greatly recommended to measure the blood pressure by both palpatory & auscultatory method. First measure the blood pressure by palpatory method to know the true SBP. Then measure the blood pressure by auscultatory method during which you should raise the cuff pressure above the SBP obtained by the palpatory method & then graduall lower the pressure to find out SBP & DBP.

HILL'S SIGN

Positive Hill's sign is characterized by increase in the femoral artery systolic BP by **>** 20mm of Hg above the brachial artery systolic BP. Normally, the difference in SBP remains within 20mm of Hg (while the diastolic BP is same in both upper & lower limbs). In severe AR, the increase is > 60 mm of Hg. It is very important & specific sign of AR.

PULSUS PARADOXUS (= PARADOXICAL PULSE = PULSUS NORMALIS AGGREGANS)

- It is an inspiratory decline in systolic blood pressure > 10 mm of Hg. It represents an exaggeration of the normal decline in systolic blood pressure during inspiration & therefore, it is not truly paradoxical. As it is an aggravation of a normal process, it is also called as **PULSUS NORMALIS AGGREGANS.**
- During inspiration, intrathoracic pressure becomes negative → Blood is sucked from the abdomen into the thorax → Venous return to the rt heart is increased → Increased blood flow through the rt heart due to increased venous return pushes the interventricular septum towards the lt side therby decreasing the lt ventricular volume & hence lt ventricular filling decreases → Cardiac output decreases → Sustolic blood pressure (SBP) decreases. This is called Reverse Berheim Effect.
- During inspiration, intrathoracic pressure becomes negative. Leading to pulmonary venous pulling i.e blood remains in the pulmonary venous system → Pulmonary venous return into the lt heart decreases → Blood flow into the lt ventricle decreases → Cardiac output decreases → Sustolic blood pressure (SBP) decreases.
- Normally the decrease in the SBP due to the aforementioned two reasons is < 10 mm of Hg. When decrease in the SBP is > 10 mm of Hg, it is called as **PULSUS PARADOXUS**, which occurs in conditions where lt ventricular filling is compromised leading to but exaggeration of normal phenomenon occurring during inspiration e.g cardiac tamponade, constrictive pericarditis, acute severe asthma (=status asthmaticus).
- The paradox is that the decrease in SBP may be so high that pulse may completely disappear during inspiration, but at the same time heart soumds may still be heard on auscultation over the apex when no pulse is palpable on the radial artery.

PROCEDURE TO DEMONSTRATE PULSUS PARADOXUS

Tie the blood pressure cuff in the pt 7 inflate the cuff till no sound is heard as you are doing during normal blood pressure measurement. Now gradually deflate the cuff. As you gradually deflate the cuff, a point will come when you will hear Korotkoff sounds intermittently. Record this point. As you go on deflating, a point will come when you will hear normal continuous Korotkoff sounds. Record this point. Now calculate the difference between the two points. If the difference is > 10 mm of Hg, then pulsus paradoxus is present & if the difference is < 10 mm of Hg, then pulsus paradoxus is absent.

CLASSIFICATION OF BLOOD PRESSURE FOR ADULTS ≥18 YEARS

CATEGORY	SBP	DBP
Optimal	**< 120**	**< 80**
Normal	**< 130**	**< 85**
High Normal	**130-139**	**85-89**
Hypertension Stage 1 (Mild)	**140-159**	**90-99**
Hypertension Stage 2 (Moderate)	**160-179**	**100-109**
Hypertension Stage 3 Severe)	**≥ 180**	**≥ 110**
Isolated systolic hypertension	**≥ 140**	**< 90**

NOTE: The above classification of blood pressure is for adults aged 18 years & older not taking antihypertensive drugs & not acutely ill, and is based on the average of ≥2 readings taken at each of two or more visits after an initial screening. **When systolic & diastolic pressures fall into different categories, the higher category should be selected to classify the individual's blood pressure status.**
>Normal SBP is 100 to 140 mm of Hg, Normal DBP is 60 to 90 mm of Hg & Normal pulse pressure is 30 to 60 mm of Hg.

C.RESPIRATORY RATE

a.____/min-Tachypnea/ Bradypnea
>Normal respiratory rate is 14-20/minute. The ratio of normal respiratory rate to normal pulse rate is 1:4.
>Tachypnea is an increased respiratory rate observed by the doctor, while dyspnea is a symptom of breathlessness i.e shortness of breath experienced by the pt. Apnea means cessation of respiration

b.Type-Abdominothoracic/ Thoracoabdominal/
Exclusively abdominal
I
>Always count respiratory rate for full **1 MINUTE** after placing fingers on radial artery to bias the Patient or place a pen on the patient's abdomen & then count the respiratory rate.
>Normal rhythm of breathing is characterized by Inspiration→Expiration→Pause. Reversed respiratory rhythm i.e Expiratory grunt→Inspiration→Pause is seen in children with acute lower respiratory tract infection.
>Per ^{0}F rise of temperature, respiratory rate increases by **2-3** breaths/minute.

TYPE OF RESPIRATION

1.Thoracic-Adult women, huge ascites, peritonitis, diaphragmatic palsy
2.Abdominal-Adult men, pleurisy, young children
3.Abdomino-thoracic-Young children, sometimes in adult men
3.Paradoxical respiration-Diaphragmatic palsy
4.Females with predominantly abdominal type of respiration-Any painful condition in the chest e.g pneumothorax, pleurisy, chest trauma
5.Males with predominantly thoracic type of respiration-Any painful condition in abdomen e.g huge ascites, acute peritonitis

>Tachypnea=Polypnea-Indicates increase in the rate of respiration.
>Hyperpnea-Increase in the rate & depth of the respiration (Increased ventilation is due to increase metabolic needs).

D.TEMPERATURE

: _____^{0}F

>Tell temperature only if you have measured. Otherwise do not tell. Do not tell-Pt. is afebrile. In the examination, measure the oral temperature, not the axillary temperature. Tell the exact value of temperature. If the temperature is normal, tell it as 99.2 F or 99.6 F. Don't use the words like low grade or high grade fever.
>Oral temperature is measured by placing the thermometer under the tongue while the pt breathes through the nose with lips firmly closed. It reflects the core body temperature.
>The axilla or groin with thigh flexed over the abdomen is also convenient to measure temparature in an unconscious pt.
>The axilla or groin with thigh flexed over the abdomen to measure temparature is preffered in infants.

FEVER TYPES

1.INTERMITTENT

Fever is present only for several hours & always touches the baseline sometimes during the day. It is of 3 types

1. **QUOITIDIAN**-The paroxysm of fever occurs daily i.e daily rise & daily fall of temperature.In double quotidian fever, double fever spike occurs in a single day.

2. **TERTIAN**-The paroxysm of fever occurs on alternate day i.e after a gap of 48 hrs.

3. **QUARTAN**-The paroxysm of fever occurs after a gap of 2 days i.e 72 hrs intervene between 2 consecutive paroxysms of fever.

2.CONTINUED

Fever does not fluctuate more than 1^{0}C (1.5^{0}F) during the 24 hr period & never touches the baseline.

3.REMITTENT

Daily fluctuation of fever is more than 2^{0}C (3^{0}F) & never touches the baseline.

TEMPERATURE RANGES

RANGE	CENTIGRADE	FARENHIT
NORMAL	36.6^0-37.2^0	98^0-99^0
SUBNORMAL	<36.6^0	<98^0
FEBRILE	>37.2^0	>99^0
HYPERPYREXIA	>41.6^0	>107^0
HYPOTHERMIA	<35^0	<95^0

I.SYSTEMIC EXAMINATION

CVS EXAMINATION

RESPIRATORY SYSTEM & GASTROINTESTINAL SYSTEM (to find out tender hepatomegaly, ascites etc.) SHOULD BE EXAMINED IN ALL CVS CASES.

>**Precordium**-Area of the anterior chest wall overlying the heart on the left side.

I.INSPECTION (OF PRECORDIUM)

1.SHAPE & SYMMETRY OF THE CHEST

a.Bilaterally symmetrical
b.Precordial Bulging/ Bulging of intercostals spaces / Kyphosis/ Scoliosis
>Precordial bulging occurs as a sign of long standing cardiac enlargement due to soft rib cage.
>Bulging intercostals spaces-Pericardial effusion, empyema thorasis etc.

TYPICAL DESCRIPTION IN NORMAL CASE-Chest is bilaterally symmetrical. Do not tell-Chest is bilaterally sym- metrical & there is no precordial bulging, because chest is bilaterally symmetrical means there is no precordial bulging. Otherwise how can the chest wall be bilaterally symmetrical with precordial bulging? So chest wall is not bilaterally symmetrical when there is chest wall bulging.

2.PULSATION

a.No visible pulsation
b.Apical pulsation-Visible/Not visible
c.Visible pulsation in- Parasternal area (RVH)/ Pulmonary area/ Epigastrium (RVH)/ Suprasternal area/ Carotid pulsation/

>Apical impulse-Visible cardiac pulsation. If apical impulse is not visible in supine position, it can be visible from the Rt. side of the Pt.by tangential view.
>The commonest cause of displacement of of the apex beat is deformity of thoracic cage usually scoliosis.

3.PROMINENT VEINS OVER THE CHEST WALL

-Absent
-Present-Pulsatile/ Nonpulsatile

4.SCAR MARK/SINUS OVER THE CHEST WALL

II.PALPATION

COUNTING OF THE RIBS & ICS

First place the rt index finger in the suprasternal notch & then go downwards till the sternal angle is reached which is felt as a transverse ridge (junction of the body of the sternum & manubrium sterni). Now if the finger is moved sideways, it will touch the 2nd rib below which lies the 2nd ICS.Then count the ribs with ICS from above downwards. Posteriorly, the ribs & ICS are counted from below upwards. If the Pt.'s arms lie by the side of his body, the inferior angle of the scapula lies at the level of T7 spine (or the 7th rib) which may help in counting ribs & ICS in the back.

METHOD OF PALPATION

1. Place the heel of the hand over the lt sternal edge & fingertips over apex, then feel the aortic & pulmonary areas by placing fingers in the intercostal spaces.
2. Pt will sit & lean forward & hold the breath in expira-tion. Standing on the rt side of the pt, put your rt palm over the sternum transversely in such a way that your fingers lie over the pulmonary area, centre of the palm rests over the sternum & thenar-hypothenar eminences (Heel of the palm) lie over the aortic area. *To feel for the thrills, place your right palm very firmly over the different areas of the chest wall.*
3. Diastolic thrill of mitral stenosis is best felt at the apex with the pt rolled on to the lt side (lt lateral recumbent position) & breath held in full expiration.
4. If thrill is present, there must be a systolic murmur. Thrill is found mostly in case of a systolic murmur. But thrill is also found in case of mid-diastolic murmur of MS. That means thrill usually indicates the presence of a systolic murmur except in MS. Except mid-diastolic murmur of MS, other diastolic murmurs are usually not associated with thrills. So, if you are telling about thrill in palpation, then you have to tell about a systolic murmur in auscultation.

>Description of thrill-If thrill is absent, tell "There is no thrill". But don't tell "There is no palpable thrill", because thrill is always palpable. There is no thrill which is not palpable.
>For palpating apex beat, use the pulp of the fingers; for thrills, use the base of the fingers; for parasternal heaves, use the base of the hand i.e thenar & hypothenar eminences.

1.MITRAL AREA

(Half inch in diameter with center at the apex of the heart)

A.APEX BEAT

1.LOCATION

-5th ICS **1 cm** medial to MCL/ Displaced-Inside or outside the MCL/ ___th ICS inside or outside the MCL
>It is the lowermost & outermost part of the precordium where a **DEFINITE BUT NOT NECESSARILY THE MAXIMUM** thrust that can be felt.
>Pt lies in supine position. Stand on the rt Side of the Pt. Place your palm firmly over the precordium. Try to feel the definite thrust (not nessarily the maximum) palpable with the pulp of the fingers & locate it with the rt index finger in the ICS by counting ribs from the sternal angle (corresponds to 2nd rib) by your lt hand. Look how far is the apex beat from the lt MCL-Inside/Outside. *To detect the character of the apex beat, press the tip of the rt index finger very firmly over the apical impulse.*
>Ask the pt to sit & lean forward & try to locate apex beat as mentioned above if it is not palpable in supine position.
>If still not palpable, say the apex could not be localized properly.
>In children, apex beat is located in the 4th ICS, while in tall-lean persons, apex beat is located in 6th ICS.
>In lt ventricular dilation, the cardiac apex shifts downward & outward while the cardiac apex shifts only outward in case of right ventricular dilation.
>Apex beat shifted upward & outward in massive ascites.

2.CHARACTER

1.**NORMAL**

Just felt by the palpating finger as a brief gentle tap, not much forceful but palpable with certainty.

2.**FORCEFUL & WELL SUSTAINED (=HEAVING)**

Lifts your finger & stays for sometime.

3.**FORCEFUL & ILLSUSTAINED (=HYPERKINETIC)**

Touches the finger & reverts back.

4.**TAPPING**

Perceived as a definite vibratory knock without the finger being actually lifted. It is of very low amplitude & illsustained.

>To note the character of the apex beat, turn the patient to lt lateral position.
>Tapping apex beat is suggestive of **PALPABLE S1 (= TAPPING APEX BEAT)** in the mitral area while heaving apex is indicative of left ventricular hypertrophy due to pressure overload. Hyperkinetic apex beat is characterized by exaggerated & illsustained thrust of cardiac impulse & is seen in volume overload conditions like anemia, AR, PDA, VSD, MR, thyrotoxicosis.

B.PULSATION-Present/ Absent

C.THRILL (**Palpable Murmur**)

1. SYSTOLIC

Synchronous with the carotid pulsation or apex beat, e.g MR (commonest), VSD, ASD (Ostium primum type)

2. DIASTOLIC

Felt before carotid pulsation, e.g MS (commonest), Left atrial myxoma (very rare).

>In mitral area, if there is any difficulty in palpating thrills, ask the pt to hold his breath after full expiration & turn the patient to lt lateral position for better palpation of thrills.
>While palpating for thrills, always put your lt thumb over the rt carotid artery at the level of the upper border of the thyroid cartilage to confirm the timing.
>Meaning of thrill-Palpable low frequency vibrations felt like a purring of a cat & is always associated with heart murmur. It is synonymous with **palpable murmur**.
>Always remember that in mitral area, diastolic thrill is very common while in all other areas (base of the heart & tricuspid area), systolic thrill is very common. In pulmonary area, thrill may be continuous or systolo-diastolic, e.g PDA.It is seen that thrill is usually present in stenotic lesions & generally absent in regurgitant lesions of the heart. Presence of a thrill in most of the time indicate that the murmur is organic.

>**CAREY COOMBS MURMUR & AUSTIN FLINT MUR-MUR ARE NOT ASSOCIATED WITH A THRILL AS THEY ARE FUNCTIONAL MURMURS & FUNCTIONAL MURMURS ARE NEVER ASSOCIATED WITH THRILL.**

2.PULMONARY AREA

(Half inch in diameter with center in the left 2nd ICS close to sternum)

A.PALPABLE P2 (=PULMONARY SHOCK= DIASTOLIC SHOCK=DIASTOLIC KNOCK)

It is found in pulmonary hypertension of any etiology.

B.PULSATION-Present/ Absent

C.THRILL

1. SYSTOLIC

Synchronous with the carotid pulsation or apex beat, e.g PS, Fallot's Tetralogy, PDA (Sometimes continuous thrill), ASD, High VSD.

2. CONTINUOUS

Felt throughout the cardiac cycle e.g PDA

3.AORTIC AREA

(Half inch in diameter with center in the right 2nd ICS close to sternum)

A.PALPABLE A2

B.PULSATION-Present/ Absent

C.THRILL

1. SYSTOLIC

Synchronous with the carotid pulsation or apex beat e.g AS (almost exclusively).

2. DIASTOLIC

Felt before carotid pulsation, e.g AR (Rare)

4.TRICUSPID AREA

(Half inch in diameter with center in the lt 5th ICS close to sternum). ***Tricuspid area corresponds to lower lt parasternal area.***

A.PARASTERNAL HEAVE (=LEFT PARASTERNAL HEAVE)

-Absent/ Present-Grade-I/ II/ III

>Pt is in supine position. Stand on the Rt. side of the pt. Place the entire hypothenar eminence of your palm upto the base of the little finger (the rest part of the palm should not touch the chest wall) vertically over the mid & lower lt parasternal area with breath held in expiration. Then look for any lifting of the hand. To grade the parasternal heave, you should firmly press the hypothenar eminence to feel whether the heave is obliterated or not. If obliterated, it is grade-II and if not obliterated, it is grade-III. *Never tell lt parasternal heave, because there is no rt parasternal heave. So parasternal heave means lt parasternal heave.*

GRADING OF PARASTERNAL HEAVE

1.**I**-Felt but hand not lifted

2. **II**-Felt & hand lifted but obliterated by applying pressure
3. **III**-Felt & hand lifted but not obliterated by applying pressure

>Parasternal heave is the anterior movement of lower left parasternal area. Parasternal heave indicates right ventricular hypertrophy or left atrial enlargement.
>Rt ventricular hypertrophy often results in a sustained systolic lift at the lower lt parasternal area which starts in early systole & is synchronous with the lt ventricular apical impulse.
>Heave means the impulse is forceful & well sustained while lift means the impulse is forceful but is not well sustained.
>The point of maximal impulse (PMI) is helpful in determining whether the rt or lt ventricle is dominant. In pt's with lt ventricular dominance, the impulse is maximal at the apex where as in rt ventricular dominance the cardiac impulse is maximal over the lower lt sternal border.

B.PULSATION

C.THRILL

1. **SYSTOLIC**

Synchronous with the carotid pulsation or apex beat, e.g TR, PS (Infundibular type), VSD, ASD (Ostium primum type)

>**FOR DEMONSTRATION OF ANY EVENT I.E PALPATION, PERCUSSION OR AUSCULTATION IN AORTIC OR PULMONARY AREA, ASK THE Pt TO *SIT & LEAN FOR-WARD*. YOU CAN DO IT IN SUPINE POSITION IN EXAM.**

5.THRILL OVER CAROTID ARTERIES

CAROTID SHUDDER

It is the systolic thrill felt over the carotid arteries by placing your thumb lateral to the upper border of thyroid cartilage. Normally, if we place our thumb over the carotid artery lightly, nothing is felt. But if carotid shudder is present, a thrill is felt which gives an impression of high volume carotid pulse to the beginner. Pulse is felt for a long time, but this thrill is felt for sometime. Tell this if present.
>When stethoscope is placed over the carotid artery having carotid shudder, we will hear a murmur called as carotid bruit. In other words, when the murmur occurs at the site of arterial stenosis, they are traditionally called bruits.

6.FEEL FOR THE

A.EPIGASTRIC PULSATION

B.SUPRASTERNAL PULSATION

III.PERCUSSION

(usually done in pericardial effusion, otherwise it is not done.)

a.Left 2nd ICS-Resonant/ Dull

b.Left 3rd ICS- Resonant/ Dull

>Normally, the lt 2nd ICS is resonant & cardiac dullness does not extend beyond the apex.
>Second ICS is obliterated (i.e dull on percussion) in pericardial effusion etc.
>Normally, the lt 3rd ICS is dull on percussion.
>Proceed from lateral side towards sternum with the pleximeter finger perpendicular to rib.

METHOD TO PERCUSS THE HEART

At first, find out the upper border of liver dullness along rt MCL.Now, for delineation of the rt border of heart, select one space higher from the upper border of liver dullness. Keeping the pleximeter finger parallel to the arbitary rt border of heart, lightly percuss from rt to lt. Actually percussion is done in the 3th & 4th ICS. As soon as dull note is obtained due to heart, mark it & then join the points to get the Rt. border of heart. Now localize the cardiac apex. For the lt border of the heart, percuss along (or parallel to) the lt **ACROMIO-XIPHOID LINE** (an imaginary line from the tip of the acromion process of the lt side to the xiphisternum) in the 2d, 3rd & 4th ICS. Now join the points of dullness with the cardiac apex to get the lt border of heart. Lastly, percuss the base of the heart to delineate the upper border of heart.

METHOD TO PERCUSS THE BASE OF THE HEART(OR PERCUSSION OF THE STERNUM OR ME-DIASTINAL PERCUSSION)

Percussion is usually done in the 2nd ICS. Ask the pt to sit. First place the **PLEXIMETER** finger in the aortic area parallel to the rt sternal border. The line of percussion in the aortic area will be perpendicular to the rt sternal border & go on percussing upto the middle of the sternum i.e go from rt to lt. Now place the pleximeter finger in the pulmonary area parallel to the lt sternal border. The line of percussion in the pulmonary area will be perpendicular to the lt sternal border & percuss upto the middle of the sternum where you left i.e now go from lt to rt. One may percuss the aortic & pulmonary areas by the above method & may stop the percussion after reaching the rt & lt borders of the sternum respectively. Then percussion of the sternum is done directly by the **PERCUSSING FINGER(=PLEXOR FINGER)** without using the pleximeter finger. Listen the percussion note carefully. Thereafter percussion may be done in the 3rd ICS.
>***BASE OF THE HEART*** often used clinically refers to the rt & lt second intercostals spaces close to the sternum.

IV.AUSCULTATION

GUIDELINES

1. Optimise acoustics
   - Ensure the ear pieces of the stethoscope fit perfectly
   - Experiment with the different degrees of pressure on the head of the stethoscope.
2. Time the sounds by feeling the carotid pulse.
3. Use the bell the low-pitched noises like 1st (S1), 2nd (S2), 3rd (S3), 4th (S4) heart sounds & mid-diastolic murmurs.
4. Use the diaphragm for high-pitched noises like pansystolic murmurs & early diastolic murmurs.
5. Listen to the noises like a piece of music-
   - What tune or candence you can hear?
   - Analyse each sound separately.

6.The best way to detect murmur or abnormal heart sounds is by comparing the auscultatory findings of the pt with yours. Put your stethpscope on your heart & on pt's heart alternatively & compare the findings.

>**START AUSCULTATION FIRST OVER MITRAL AREA, THEN IN THE PULMONARY AREA, THEN IN AORTIC AREA, THEN IN TRICUSPID AREA & THEN IN LT 3RD & 4TH INTERCOSTAL SPACES.**
>**BELL OF THE STETHOSCOPE** is used to listen lowpitched sounds like-Murmur of MS, TS, S3 & S4, Fetal heart sounds, Venous hum etc. During the use of the bell, it should be placed very lightly over the skin.
>**1**.Bell is lightly pressed (just enough to produce an air seal with its full rim) to the skin to listen **LOW PITCHED SOUND**. **2**.Diaphragm is firmly applied to the skin to listen **HIGH PITCHED SOUND**.
>Low-pitched sounds like murmurs of MS & TS are best auscultated by the bell of the stethoscope while all other murmurs are best auscultated by the diaphragm of the stethoscope.
>3rd (S3) & 4th (S4) heart sounds are best heard with the pt turned to the left side & auscultated with the bell of the stethoscope.
>Conventional abbreviations used in cardiac auscultation are-

- **S1-First heart sound**-Produced by closure of mitral & tricuspid valves.
- **S2-Second heart sound**-Produced by closure of aortic & pulmonary valves.
- **A2-Aortic component of second heart sound (S2)-**Produced by closure of aortic valves.
- **P2-Pulmonary component of second heart sound (S2)-**Produced by closure of pulmonary valves.
- **S3-Third heart sound**
- **S4-Fourth heart sound**
- **OS-Opening snap**
- **EC-Ejection click**

A.MITRAL AREA (=CARDIAC APEX)

(Half inch in diameter with center at the apex of the heart)
>By saying **cardiac apex or apex of the heart**, we normally mean **MITRAL AREA**. So, mitral area can be assumed to be **synonymous** with the **apex of the heart or cardiac apex or simply apex.**

POSITION OF THE PATIENT

Before auscultation, localize the apex beat by palpation with the pt in supine position. If the apex beat could not be localized properly, auscultate the area below the lt nipple. At first, you auscultate the pt in supine (i.e dorsal decubitus) position with the diaphragm of the stethoscope. Then you auscultate the pt in left lateral position at the height of expiration with the bell of the stethoscope. The auscultatory findings of supine position are accentuated in left lateral position as the heart moves closer to the anterior chest wall & at the height of expiration as left sided events are more pronounced during expiration.

>While auscultating, place your left thumb over the rt carotid artery at the level of the upper border of the thyroid cartilage to distinguish S1 which is synchronous with the carotid pulsation from S2 which is felt after carotid pulsation.
>In the presence of mitral systolic (pansystolic) murmur, auscultate the lt axilla & inferior angle of scapula for radiation of MR (=MI) murmur.

1.HEART SOUND

>DESCRIBE ONLY FIRST HEART SOUND in mitral area & not other heart sounds.
>First heart sound (S1)-Auscultated with the diaphragm

- **Intensity**-Normally audible/ Loud & snapping (in MS)/ Distant (in Pericardial effusion)
- **Rhythm**-Regular/ Irregular

>Heart sounds are distant means the intensity of heart sounds is decreased on auscultation i.e heart sounds become muffled e.g pericardial effusion.
>Tell that heart sounds are distant if sounds are diminished in intensity.
>Do not tell S1 to the examiner. Tell first heart sound. Similarly do not tell the other abbreviations to the examiner.
>**ALWAYS MENTION THE HEART SOUNDS FIRST IN CARDIAC AUSCULTATION.**

2.MURMUR

*Tell only if present.
Murmurs originating from the rt side of the heart increase in the intensity during inspiration owing to increase in the stroke output of the rt ventricle. Conversely, murmurs arising from the lt side of the heart are accentuated during expiration.

A.TIMING

a.SYSTOLIC

PANSYSTOLIC (=HOLOSYSTOLIC)

Starts immediately with S1 & continue through to the S2& ends after S2. These murmurs always have a uniform intensity, e.g MR

LATE-SYSTOLIC

e.g Hypertrophic obstructive cardiomyopathy

b.DIASTOLIC

MID-DIASTOLIC

Heard relatively late after the S2 & continue for a variable period during mid-diastole e.g MS, Carey coombs murmur, Apical middiastolic murmur of AR (Austin Flint murmur)

AUSTIN FLINT MURMUR

It is a soft, lowpitched, rumbling, middiastolic murmur heard at the mitral area. It is associated with severe aortic regurgitation. It is probably produced by the diastolic displacement of the anterior leaflet of the mitral valve by the aortic regurgitation jet leading to partial closure of the anterior mitral leaflet & therby rendering the mitral valve functionally stenotic. But it does not appear to be associated with

hemodynamically significant mitral obstruction and in contrast to the diastolic murmur of the MS, it is not accompanied by an opening snap or loud S1.

CAREY-COOMBS MURMUR

It is a soft middiastolic murmur may sometimes be heard in acute rheumatic fever due to inflammation of the mitral valve cusps with nodules on the mitral valve leaflets or excessive lt atrial blood flow as a consequence of mitral regurgitation.

B.QUALITY=CHARACTER

-Soft/ Soft & blowing/ Rough/ Loud & rough

>Regurgitant murmurs produced by backward leakage through a closed but incompetent valve are soft & blowing in character. **PANSYSTOLIC MURMUR IS ALWAYS SOFT & BLOWING IN CHARACTER.**

>**OBSTRUCTIVE MURMURS** produced due to obstruction to forward flow of blood through the narrowed valves are usually **ROUGH** in character.
>If you can not recognize the quality of murmur in exam, don't worry. First you diagnose the case & then retrogradely tell the quality of murmur found in that disease even if you can not appreciate that in the given pt.

C.LOUDNESS GRADE

-I/VI, II/VI, III/VI, IV/VI, V/VI, VI/VI

LOUDNESS GRADE

GRADE	CHARACTERISTICS
I	Heard with stethoscope with **utmost concentration** (in a quiet room) i.e very faint or soft.
II	**Easily heard**, not so loud & no thrill (i.e soft)
III	Moderately loud, no thrill & heard with **lightly placed stethoscope**
IV	Loud with thrill & heard even with the **edge of the stethoscope** touching the chest
V	Very loud & with thrill & heard with **stethoscope half inch away** from chest over a wide area
VI	Heard **without stethoscope**, associated with thrill. Heard with the stethoscope removed from the contact with the chest i.e stethoscope is kept close to the chest wall but not in contact with the chest wall.

❖ ***FOR SIMPLICITY, ONE CAN REMEMBER THAT A MURMUR OF GRADE-III IS NOT ASSOCIATED WITH A THRILL WHILE A MURMUR OF GRAD IV IS ASSOCIATED WITH A THRILL. GRADE V MURMUR IS VERY SEVERE & IS ASSOCIATED WITH VISIBLE PULSATION. FUNCTIONAL MURMURS ARE NEVER ASSOCIATED WITH THRILLS. SO, IF A MURMUR IS ONLY HEARD BUT IS NOT ASSOCIATED WITH A THRILL, THEN IT IS GRADE III. IF A MURMUR IS HEARD & IS ASSOCIATED WITH A THRILL, THEN IT IS GRADE IV***

>Typical description-Murmur is III/VI in intensity.

D.RADIATION TO

-Carotids in neck/ Lt axilla/ Back of the chest/ Lt sternal edge/ Upper right sternal edge
*Radiation is useful in differentiating systolic murmurs.

E.POSITION

-Heard best in-Dorsal decubitus position/ Lt lateral position/ Sitting & leaning forward position

F.HEARD BEST WITH

-Bell/ Diaphragm of the stethoscope

G.HEARD BEST IN

-Full expiration/ Full inspiration

TYPICAL DESCRIPTION OF MURMUR

A harsh midsy-stolic ejection murmur of grade IV/VI with radiation towards carotids is heard. The murmur is best audible in full expiration with the pt sitting & leaning forward & with the diaphragm of the stethoscope.

3.ADDED SOUND

a.OPENING SNAP (OS)

-Present/ Absent

>It is heard just after S2 i.e in the early part of the diastole (between 0.04s to 0.12s after A2) & is immediately followed by mid-diastolic murmur of MS. It is sharp & high pitched & is best heard in standing position after expiration with the diaphragm of the stethoscope at lower left sternal border. It is loudest in between the apex beat & the lt sternal border & may be the loudest sound in the cardiac cycle. The sound radiates well to the base of the heart.
>It is usually due to stenosis of an atrioventricular valve, mostly mitral valve, but can be heard ion tricuspid valve stenosis.
>It is almost always heard in all cases of pure MS, but is absent or masked in severe sclerosis & calcification of the mitral valve, associated severe MR, severe degree of pulmonary hypertension (PHTN) & RVH & in the presence of significant AR.
>Produced due to elevated left atrial pressure causing forceful opening of the thickened & stiff mitral valve leaflets in MS.
>The A2-OS interval is inversely related to the height of the mean left atrial pressure.

b.EJECTION CLICK (EC)

-Present/ Absent

>Sharp & high-pitched clicking sound heard immediately after S1 i.e in early part of systole & is immediately followed by the ejection murmur. It is loudest in expiration & is best audible in aortic area (Aortic Ejection Click) and pulmonary area (Pulmonary Ejection Click).
>Aortic Ejection Click does not change with respiration & can be heard all over the precordium, while Pulmonary Ejection Click increases in intensity with expiration & is localized to the pulmonary area.
>Pulmonary Ejection Click is the only rt sided event which is best heard in expiration & is not accentuated in inspiration.

>The clicks are due to sudden opening of the aortic or pulmonary semilunar valves in conditions where this opening is delayed like AS,PS, Hypertension. Its presence indicates that stenosis is at the valvular level & the stsnosis i.e AS or PS is of milder degree.

c.MIDSYSTOLIC CLICK (=NON-EJECTION CLICK)

Heard in the systole, but later than systolic ejection sounds. That is why it is called as midsystolic clik. Heard in mitral valve prolapse.

*Just know it. Don't tell in exam even if you detect it. Tell only when asked.

d.THIRD HEARD SOUND (S3)

-Present/ Absent

Low pitched sound produced in the ventricle 0.14 to 0.16 seconds after A2 in the early part of the diastole at the termination of rapid filing phase. S3 occurs due to increase in the rate or increase in the volume of ventricular filling. It is best heard with the bell of the stethoscope at the cardiac apex. S3 & S4 are caused by abrupt tensing of the ventricular walls following rapid diastolic filling. Rapid filling occurs early in the diastole (S3) following atrioventricular valve opening & again later in the diastole (S4) due to atrial contraction.
*Just know it. Don't tell in exam even if you detect it. Tell only when asked.

e.FOURTH HEART SOUND (S4)

-Present/ Absent

- Low pitched, presystolic (i.e heard before S1) sound produced in the ventricle late in the diastole during 2nd rapid filling phase. It is associated with effective atrial contraction. It occurs when there is increased resistance to ventricular filling due to diminished ventricular compliance.
- S4 is caused by inrush of blood into the ventricles when the atria contract & hence it is also called as the Atrial Heart Sound. It is heard during the ventricular filling phase of the cardiac cycle (Presystolic sound).
- S4 is more commonly pathological & occurs when vigorous atrial contraction late in the diastole is required to augment filling of a hypertrophied, non-copliant ventricle (e.g hypertension, aortic stenosis, hypertrophic cardiomyopathy)
- It is low pitched (frequency usually 20 Hz or less). It is not audible to the unaided ear & is almost never heard even with a stethoscope because of its weakness and low frequency. It becomes audible when diminished ventricular compliance increases the resistance to normal filling.
- It is best heard (Loudest) at the apex with the bell of the stethoscope when the pt is in left lateral position. It is accentuated by mild isotonic or isometric exercise in the supine position.

>Apex means left ventricular apex. There is no right ventricular apex.
*Just know it. Don't tell in exam even if you detect it. Tell only when asked.

f.GALLOP RHYTHM

-Present/ Absent

>If S3 or S4 is heard along with S1 & S2, it is called **TRIPPLE RHYTHM**. Tripple rhythm plus tachycardia is called **GALLOP RHYTHM** because of its resemblance with the candence produced during galloping of horses. Presence of gallop rhythm is a cardinal sign of lt vent-
ricular failure (LVF).
>S3 or S4 are best heard at the apex with the bell of the stethoscope placed lightly. Sometimes they are best heard with the pt turned to lt lateral position. Often they are better felt than heard. They are low pitched sounds. Left-sided S3 (LVF) is best audible at the apex during expiration while the right-sided S3 (RVF) is best heard at the lower lt sternal border during inspiration.
>**S3 Gallop=Protodiastolic Gallop**
*Just know it. Don't tell in exam even if you detect it. Tell only when asked.

g.PERICARDIAL KNOCK

-Present/ Absent

It is the S3 that occurs earlier i.e 0.01s to 0.12 seconds after A2 & is higher pitched than normal. It is due to sudden deceleration of ventricular filling because of restrictive effect of the adherent pericardium. It often occurs in constrictive pericarditis.
*Just know it. Don't tell in exam even if you detect it. Tell only when asked.

h.PERICARDIAL FRICTION RUB (=PERICARDIAL RUB)

-Present/ Absent

*Just know it. Don't tell in exam even if you detect it. Tell only when asked.

i.VENOUS HUMS

-Present/ Absent

A continuous venous hum at the base of the heart reflects hyperkinetic jugular venous flow. It is particularly common in infants & usually disappears on lying flat.
*Just know it. Don't tell in exam even if you detect it. Tell only when asked.

j.TUMOR PLOP

-Present/ Absent

Low pitched sound audible during early or mid-diastole & is produced due to the tumor abruptly stopping as it strikes the ventricular wall. Heard in atrial myxoma.
*Just know it. Don't tell in exam even if you detect it. Tell only when asked.

SEQUENCE OF SOUNDS HEARD IN CARDIAC AUSCULTATION:-
S4→S1→EC→S2→OS→PK→S3→S4.

This means EC is heard after we hear S1 but before we hear S2 and OS, PK, S3 & S4 is heard after we hear S2 but before we hear S1. EC means ejection click, OS means opening snap & PK means pulmonary knock.

- All added sounds are heard in diastole except ejection click & mid-systolic click which are heard in systole.
- Sounds produced when the valve closes- Opening snap & Ejection click
- Sounds produced when the valve opens- **S1 & S2**
- Sounds produced with open valves due to turbulence- **S3 & S4**
- Sound heard shortly after **S1-** Ejection click
- Sound heard shortly before **S1**- **S4**
- Sound heard shortly after **S2** – Opening snap/ Pericardial knock/ Tumor plop/ **S3**
- Sound heard midway between **S1 & S2** – Mid-systolic click
- Opening snap due to mitral stenosis occurs earlier than opening snap due to tricuspid stenosis.
- Heart sounds are so named because they occur in that sequence i.e **S1** is heard followed by **S2**, followed by **S3** & followed by **S4** & then **S1** starts again.

B.PULMONARY AREA

(Half inch in diameter with center in the left 2nd ICS close to sternum)

POSITION OF THE Pt -Pt lies supine. Auscultate with the diaphragm of stethoscope at the height of inspiration (as right sided events are more pronounced during inspiration). The auscultatory findings are heard better i.e. accentuated when the auscultation is carried out with the pt sitting & leaning forward because, in this position, the base of the heart moves forward i.e. close to sternum.

1.HEART SOUND

-Pulmonary component (P2) of the second heart sound (S2) is-Normally audible/ Loud/ Distant (i.e feeble or muffled)

SPLITTING OF THE HEART SOUNDS

- Normally we hear two heart sounds i.e S1 & S2
- S1 representing both mitral & tricuspid valve closure is usually single i.e usually, mitral valve closure & tricuspid valve closure occurs simultaneously without any gap, and therefore we hear a single first heart sound. We never hear mitral & tricuspid valve closure sounds separately.
- S2 representing both aortic & pulmonary valve closure is usually not single i.e usually, aortic valve closure (A2) & pulmonary valve closure (P2) do not occur simultaneously i.e there is a gap between A2 & P2. This is called splitting of heart sound. **Normally A2 is first heard & then P2 is heard except in case of reversed splitting in which P2 is first heard & then A2 is heard.**

- **PHYSIOLOGICAL SPLITTING**

During inspiration, increased venous return to the right heart delays right ventricular emptying in comparision to left ventricle leading to closure of aortic valve earlier than pulmonary valve. But during expiration, no such thins happen and therefore there is no splitting & we hear a single S2. This is called physiologica splitting.

2.MURMUR

A.TIMING

a.SYSTOLIC

EJECTION SYSTOLIC (=MID-SYSTOLIC)

Starts shortly after S1 & disappears before S2, loudest in the aortic area (with radiation to the neck) or in the pulmonary area & best heard with the diaphragm of the stethoscope while the pt sits forward e.g PS, Fallot's tetralogy. Ejection systolic murmurs are always mid-systolic murmurs & are never early systolic murmurs.

b.DIASTOLIC

EARLY DIASTOLIC

High pitched & start immediately after S2 fading away in mid-diastole. Best heard with diaphragm of the stethoscope while the pt leans forward e.g PR

c.CONTINUOUS (=SYSTOLO-DIASTOLIC)

Heard during systole & diastole. Persists through the end of systole & beginning of diastole. Are uninterrupted by valve closure & **OBLITERATES THE S2**. **Obliteration of S2 is a must to characterize the murmur as continuous murmur** e.g PDA

B.QUALITY=CHARACTER

-Soft/ Soft & blowing/ Rough/ Loud & rough

C.LOUDNESS GRADE

-**I/VI, II/VI, III/VI, IV/VI, V/VI, VI/VI**

D.RADIATION TO

-Carotids in neck/ Lt axilla/ Back of the chest/ Lt sternal edge/ Upper rt sternal edge
*Radiation is useful in differentiating systolic murmurs.

F.HEARD BEST WITH

-Bell/ Diaphragm of the stethoscope

G.HEARD BEST IN

-Full expiration/ Full inspiration

E.POSITION

-Heard best in-Dorsal decubitus position/ Lt lateral position/ Sitting & leaning forward position

3.ADDED SOUND

C.AORTIC AREA

(Half inch in diameter with center in the rt 2nd ICS close to sternum)

POSITION OF THE Pt-Pt lies supine. Auscultate with the diaphragm of stethoscope at the height of expiration (as left sided events are more pronounced during expiration). The auscultatory findings are heard better i.e. accentuated when the auscultation is carried out with the pt sitting & leaning forward because, in this position, the base of the heart moves forward i.e. close to sternum. Confirm the radiation of murmur to carotids (AS) or towards the neoaortic area (AR).

1.HEART SOUND

-Aortic component (A2) of the second heart sound (S2) is-Normally audible/ Loud/ Distant (i.e feeble or muffled)

2.MURMUR

A.TIMING

a.SYSTOLIC

EJECTION SYSTOLIC (=MID-SYSTOLIC)

Starts well after S1 & disappears before S2, loudest in the aortic area (with radiation to the neck) or in the pulmonary area & best heard with the diaphragm of the stethoscope while the pt leans forward e.g AS, Hypertrophic Cardiomyopathy (HCM) & Bicuspid aortic value (Midsystolic). Ejection systolic murmurs are always mid-systolic murmurs & are never early systolic murmurs.

b.DIASTOLIC

EARLY DIASTOLIC

High pitched & start immediately after S2 fading away in mid-diastole. Best heard with diaphragm of the stethoscope while the pt leans forward e.g AR, Graham Steell Murmur

GRAHAM STEELL MURMUR

The Graham Steell murmur of pulmonary regurgitation is a high-pitched, early diastolic, decrescendo blowing murmurheard along the lt sternal border which results from the dilatation of the pulmonary valve ring in mitral valve disease & severe pulmonary hypertension. This murmur may be indistinguishable from the more common murmur produced by aortic regurgitation.

c.CONTINUOUS (=SYSTOLO-DIASTOLIC)

Heard during systole & diastole. Persists through the end of systole & beginning of diastole. Are uninterrupted by valve closure & **OBLITERATES THE S2**. **Obliteration of S2 is a must to characterize the murmur as continuous murmur** e.g PDA

B.QUALITY=CHARACTER

-Soft/ Soft & blowing/ Rough/ Loud & rough

C.LOUDNESS GRADE

-**I/VI, II/VI, III/VI, IV/VI, V/VI, VI/VI**

D.RADIATION TO

-Carotids in neck/ Lt Axilla/ Back of the chest/ Lt sternal edge/ Upper rt sternal edge
*Radiation is useful in differentiating systolic murmurs.

F.HEARD BEST WITH

-Bell/ Diaphragm of the stethoscope

G.HEARD BEST IN-Full expiration/ Full inspiration

E.POSITION

-Heard best in-Dorsal decubitus position/ Lt lateral position/ Sitting & leaning forward position

3.ADDED SOUND

D.TRICUSPID AREA

(Half inch in diameter with center in the Lt 5th ICS close to sternum)

POSITION OF THE Pt -Pt lies supine. Auscultate with the diaphragm of stethoscope at the height of inspiration.

1.HEART SOUND

2.MURMUR

A.TIMING

1.SYSTOLIC

a.PANSYSTOLIC (=HOLOSYSTOLIC)

Starts immediately with S1 & continue through to the S2& ends after S2. These murmurs always have a uniform intensity, e.g TR

b.DELAYED DIASTOLIC

e.g ASD

B.QUALITY=CHARACTER

-Soft/ Soft & blowing/ Rough/ Loud & rough

C.LOUDNESS GRADE

-**I/VI, II/VI, III/VI, IV/VI, V/VI, VI/VI**

D.RADIATION TO

-Carotids in neck/ Lt axilla/ Back of the chest/Lt sternal edge/ Upper rt sternal edge
*Radiation is useful in differentiating systolic murmurs.

F.HEARD BEST WITH

-Bell/ Diaphragm of the stethoscope

G.HEARD BEST IN

-Full expiration/ Full inspiration

E.POSITION

-Heard best in-Dorsal decubitus position/ Lt lateral position/ Sitting & leaning forward position

3.ADDED SOUND

>Typical description-No murmurs & no added sounds are heard.

E.LEFT 3rd& 4th PARASTERNALREGION

NEOAORTIC AREA

-Murmur heard/ Murmur not heard

*Tell only if present.

- **NEOAORTIC AREA**-***Lt 3rd ICS*** close to parasternal line. This area is auscultated with the pt sitting & leaning forward position at the height of expiration with the diaphragm of the stethoscope. Aortic regurgitation murmur best heard in this region.

MURMURS HEARD IN NEOAORTIC AREA

1.SYSTOLIC

a.EJECTION SYSTOLIC (=MID-SYSTOLIC)

Starts well after S1 & disappear before S2, loudest in the aortic area (with radiation to the neck) or in the pulmonary area & best heard with the diaphragm of the stethoscope while the pt sits forward e.g ASD. Ejection systolic murmurs are always mid-systolic murmurs & are never early systolic murmurs.

>ASD murmur is heard in pulmonary area & neoaortic area.

b.PANSYSTOLIC (=HOLOSYSTOLIC)

Starts immediately with S1 & continue through to the S2& ends after S2. These murmurs always have a uniform intensity, e.g VSD. VSD does not produce continuous murmur.

2.DIASTOLIC

a.EARLY DIASTOLIC

High pitched & start immediately after S2 fading away in mid-diastole. Best heard with diaphragm of the stethoscope while the pt leans forward e.g AR

MURMURS HEARD ALONG LEFT STERNAL BORDER

1. Murmur of functional TR in severe pulmonary hypertension in MS.
2. Graham-Steel murmur of PR.
3. Rt sided S3 (Right ventricular gallop) is heard at the lower lt sternal border.

F.CAROTID BRUIT

-Heard/ Not heard

>Put your stethoscope over the carotid artery and listen for any murmur.

G.PERICARDIAL FRICTION RUB

-Present/Absent
*Tell only if present.

PERICARDIAL FRICTION RUB

High pitched, superficial, SCRATCHING, inconstant, to-and-fro, leathery sound audible during the any part of the cardiac cycle. Best heard at the left side of the lower sternum using the diaphragm of the stethoscope with the Pt. breathing out in sitting position. Intensity of the sound increases when the Pt. sits & leans forward & also by pressing the diaphragm of the stethoscope (pleural friction rub does not increase in intensity by pressing the diaphragm of the stethoscope). Sound continues even after holding the breath (in contrast to pleural friction rub which disappears after holding the breath) & may be associated with chest pain & usually there is no transmission (i.e localized). The hallmark of diagnosis of pericarditis is pericardial rub.

>**PLEUROPERICARDIAL RUB**-It is due to rubbing of the pleura with the pericardium.It is confused with the pericardial rub.
>**Describing normal CVS**-First & second heart sounds
are normally audible,No murmur & No added sounds.

F.OTHER

1.PISTOL SHOT SOUND (=TRAUBE'S SIGN)

Booming sound produced after lightly pressing the bell of the stethoscope over the femoral artery.

2.DUROZIEZ'S MURMURS

Place the diaphragm of your stethoscope over the femoral artery just below the inguinal ligament. Press(by tilting the diaphragm) the upper margin (below the inguinal ligament) of the diaphragm of the stethoscope to hear a systolic murmur in case of aortic regurgitation (AR) which has no special name.If you press the lower margin(away from the inguinal ligament) of the diaphragm of the stetho-scope,the diastolic murmur thus heard is called Duroziez's murmur.Duroziez's murmur is heard before the Pistol-shot sound.

3.DANCING CAROTID (=CORRIGAN'S SIGN)

It is seen in sitting position.It is the exaggerated arterial pulsation in the carotid artery in the neck.

4.QUINCKE'S SIGN (CAPILLARY PULSATION)

- When pressure is applied to the fingertips or nails,there is alternate flushing and pallor of the nail bed OR
- When a glass slide is on the everted lower lip(inner aspect of lower lip),it produces alternate redness and blanching OR you can press the upper part of the tongue with a glass slide similarly.

5.COLLAPSING PULSE
(=WATER HAMMER PULSE=CORRIGAN'S PULSE)

6.LOCOMOTOR BRACHIALIS

7.CORRIGAN'S PULSE

8.De MUSSET'S SIGN

To-and-fro head nodding synchronous with the carotid pulsation.

RESPIRATORY SYSTEM EXAMINATION

POSITIONING THE PATIENT BEFORE EXAMINING THE RESPIRATORY SYSTEM

Respiratory system is usually examined in standing position. It is examined in sitting position if the

patient is unable to stand. While examining the anterior (front) chest wall, ask the pt to sit or stand erect with both the upper limbs hanging on the sides of the body laterally. While examining the lateral chest wall, ask the pt to raise both his upper limbs, flex them at the elbow & place both his palms over the head, with one palm above the other. This will expose the lateral chest wall for examination. While examining the posterior (back) chest wall, ask the pt to flex both the upper limbs at the elbow, cross the forearms & then place the crossed forearms on the anterior (front) chest wall. This will separate the two scapulae & help in the examination of the back.

>Inspection of back in respiratory system & cardiovascular system is always done in ***STANDING*** position if the condition of the pt permits to avoid undue obliquity.

AREAS OF THE CHEST WALL

a.ANTERIOR (FRONT) CHEST WALL

From above downwards, the areas are
1.**SUPRACLAVICULAR**
2.INFRACLAVICULAR
3.MAMMARY

There is no inframammary area.

b.LATERAL CHEST WALL

From above downwards, the areas are
1.AXILLARY
2.INFRAAXILLARY

There is no midaxillary area.

c.POSTERIOR (BACK) CHEST WALL

From above downwards, the areas are
1.**SUPRASCAPULAR**
2.INTERSCAPULAR (UPPER & LOWER)
3.INFRASCAPULAR

There is no middle interscapular area.

I.INSPECTION

1.POSITION OF TRACHEA

-Central/ Shifted to rt/ Shifted to lt
>Typical description in a normal case-Trachea appears to be central.

2.SHAPE OF THE CHEST

-Elliptical/ Barrel shaped/ Pigeon chest (=Pectus craniatum)/ Funnel shaped chest (=Pectus excavatum)

To know the shape of the chest, you have to measure the transverse as well as anteroposterior diameter of the chest. To measure the transverse diameter of the chest, ask the pt to raise both of his hands & then stand in contact with the wall (of the examination room). Then place a cardboard on the lateral side of the opposite chest wall facing the wall (of the examination room). Then measure the distance between the wall & the cardboard which will give you the transverse diameter of the chest. Similarly, for measuring the anteroposterior diameter of the chest wall, ask the pt to stand erect with his back in close apposition with the wall (of the examination room). Then place a cardboard over the anterior chest wall and measure the distance between the cardboard and the wall (of the examination room) which will give you the anteroposterior diameter of the chest wall.

DESCRIPTION OF THE NORMAL CHEST

Elliptical in crossection i.e transverse to anteroposterior diameter ratio is 7:5, bilaterally symmetrical and without undue elevation or depression. Both the sides of the chest move simultaneously & symmetrically. Subcostal angle is acute i.e < 90^0 (males having a narrower angle than females).
>In barrel shaped chest, the anteroposterior diameter is more than the transverse diameter of the chest.

3.SYMMETRY OF THE CHEST

- Bilaterally symmetrical
- Kyphosis/ Scoliosis/ Precordial bulging/ Bulging of ICS/ Flattening of chest wall

>Note the distance of medial borders of scapulae from midline on the both sides which is useful to assess any asymmetry of the chest.
>Inspection for the shape & movement of the chest-For this the pt should stand absolutely straight. Sitting means the pt will sit on a stool.
>There is bulging of ICS in pleural effusion or empyema & pericardial effusion.

METHOD TO DETECT SCOLIOSIS

The pt will stand straight with fully exposed chest & the observer looks for scoliosis from his back. It is observed whether the convexity is present in lt or rt side. Afterwards, it may be corroborated by palpation of the spine. Scoliosis means lateral bending of the spinal cord.

METHOD TO DETECT KYPHOSIS

The observer inspect the back from the sides in profile i.e a tangential view from both the sides are necessary. The pt will stand straight with fully exposed chest. In kyphosis, there is increase in the anteroposterior diameter of the chest. Kyphosis means backward bending of the vertebral column with its convexity posteriorly.
>Normal chest is bilaterally symmetrical.

4.LOCATION OF APICAL IMPULSE

-5th ICS 1.5 cm (½ inch) medial to MCL/ Displaced-Inside or outside the MCL
>In inspection, you tell that apical impulse is not visible.

5.MOVEMENTS OF THE CHEST WALL WITH RESPIRATION

- Both the sides of the chest move simultaneously & symmetrically
- Restriction of movement of any part

6.FULLNESS/ DEPRESSION OF CHEST

- Localised-Rt/ Lt
- Generalised-Rt/ Lt

7.PROMINENT VEINS OVER THE CHEST WALL

-Absent/ Present-Pulsatile/ Nonpulsatile
>Position of mediastinum is determined by noting the trachea & apex beat position i.e whether these two are in central position or shifted to one side.

TRAIL'S SIGN (=STERNOMASTOID SIGN)

Undue prominence of sternal head of the stenomastoid muscle on that side towards which the trachea is deviated.

8.DROOPING OF SHOULDER

-Present/Absent

>Drooping of the shoulder is examined in standing position of the pt at a distance of **5 METER** (If you observe very close to the pt, you will miss finer abnormalities). Look from backside & observe for-

- Lower angle of scapula on the diseased side is at a lower level than on the healthy side.
- Area between the spinous processes of vertebrae & medial border of scapula is increased on diseased side than on the healthy side.
- Crowding of the ribs on the diseased side.

>From the above three findings, you can conclude that there is drooping of shoulder which signifies apical fibrosis or collapse of lung. Tell drooping of the shoulder is present only when above three findings are present.

9.CROWDING OF RIBS

-Present/ Absent
>See from backside & frontside

10.WIDENING OF INTERCOSTAL SPACES

- Present/ Absent

11.SKIN OVER THE CHEST

-Puncture mark/ Scar mark/ Discharging sinus

12.RESPIRATORY MOVEMENT

A.RHYTHM

- **1**.Regular
- Irregularly irregular (=Biot's breathing)
- Regularly irregular (=Cheyne-Stokes respiration)
- Miscellaneous-Stertorous breathing

B.TYPE

-Abdominothoracic/ Thoracoabdominal/ Exclusively abdominal/ Exclusively thoracic/ Paradoxical respiration/ Pursed-lip breathing

C.DEPTH

-Normal/ Shallow/ Deep/ Kussmaul's breathing

D.INDRAWING OF

- Intercostal spaces (Intercostal suction)-Present/Absent
- Subcostal spaces-Present/ Absent
- Suprasternal fossa (or space)-Present/ Absent
- Supraclavicular fossa-Present/ Absent

>**HOOVER'S SIGN**-Paradoxical inward movement of rib cage with respiration.

E.ACCESSORY MUSCLES OF RESPIRATION
(Sternomastoid, scalenii & trapezii)

-Used/ Not used

BIOT'S BREATHING

This type is sometimes slow & sometimes rapid & is found in meningitis, Children etc.

CHEYNE-STOKES BREATHING

STERTOROUS BREATHING

II.PALPATION

1.POSITION OF TRACHEA

- Central/ Shifted to rt/ Shifted to lt

>Pt. is in standing (most preferable) or sitting position with arms placed symmetrically on two sides & chin held in midline (**TRACHEA SHOULD NOT BE EXAMINED IN LYING DOWN POSITION UNLESS THE PATIENT IS VERY ILL**). Stand in front of the pt & place your index & ring finger of the rt hand on sternoclavicular joints of either side. The middle finger is placed on the cricoid cartilage (lies below thyroid cartilage) & gently slide it down over the tracheal rings upto suprasternal notch. The trachea is normally felt in the midline & in deviation, finger will slide down along the other side of the trachea.
>Place index finger firmly into the suprasternal notch & locate the tracheal rings in relation to sternum.
>Find out the space between the anterior border of sternomastoid & trachea. In deviation, the space appears to be narrow on the side towards which the trachea is deviated.

2.LOCATION OF APEX BEAT

-5^{th} ICS ½ inch medial to MCL/ Displaced-Inside or outside the MCL
>SHIFTING OF MEDIASTINUM IS DETERMINED FROM THE POSITION OF TRACHEA & LOCATION OF APEX BEAT.

3.MOVEMENTS OF CHEST WALL

- Bilaterally symmetrical
- Restricted in-Rt side/ Lt side
>One has to assess whether both sides of the chest are moving simultaneously & symmetrically, or not. This is conventionally done at three places-

A.FRONT

First ask the pt to exhale completely. Anteriorly, place the curve formed by your ulnar border of thumb & radial border of index finger of the two hands on the chest wall just below the nipple while two thumbtips apposing eachother in midline with a fold of skin between the thumbtips. Ask the pt to take deep breath & observe the movements of the thumbtips away from the midline.

B.BACK

a.INTERSCAPULAR AREA

First stand behind the pt. Then ask the pt to exhale completely. Place the palms vertically side by side in the interscapular region. Note the elevation or lifting of the palms with inspiration.

b.INFRASCAPULAR REGION

Same method, as used for the front of the chest. Note the separation of thumbtips with inspiration.

C.APEX

1.PREFERRED METHOD

First ask the pt to exhale completely. Then standing behind the pt, place your medial 4 finger & palm over the shoulder in such a way that the 2 thumbs meet in the midline in obliquely & downward direction. Ask the pt to take deep breath in & you observe the separation of thumbtips from the midline.

2.ALTERNATIVE METHOD

First ask the pt to exhale completely. Then standing behind the Ppt, place the two thumbs at the nape (back) of the neck with their radial border in apposition in the midline at the level of the vertebral prominence (spinous process of 7^{th} cervical vertebra) & the palms resting on the shoulders. Ask the pt to take deep breath & observe the elevation or lifting of the thumbs. The movement of the apex may be examined from the front in a pt who is unable to sit:- pt will lie down & palms will be placed over the clavicles from the front.

>After the clinical assessment of the movement of the chest, always measure the expansion with a measuring tape.
>Movement of the chest is examined only anteriorly & posteriorly, but is never examined laterally.

4.EXPANSION OF CHEST WALL

1.PREFERRED METHOD

Hold the tape at the nipple level with both the hands in such a way that your hands do not touch the chest wall by crossing the tape in the midline. Then ask the pt to exhale & then take deep breath in & hold it. At the end of the exhalation, note the markings on the tape. When the pt starts taking deep breath, you release the tape from one hand & note the marking at the end of the inspiration. Find out the chest expansion from initial & final reading of the tape.

2.ALTERNATIVE METHOD

Measured with a measuring tape placed just below the nipple with zero mark at the middle of the sternum & the pt is asked to take breath in & out as deep as possible. Measure the expansion at both maximum inspiration & maximum forced expiration & findout the difference. In women, breast tissue should be avoided by making the measurements just above or below the breast. It is important that several readings should be taken as the initial respiratory efforts are often irregular than subsequent ones.

>Normal expansion is more than equal to 5 cm (5-8 cm) in an adult. Expansion of less than 5 cm is described as restricted & expansion of 2cm or less is described as grossly restricted.

METHOD TO MEASURE THE EXPANSION HEMITHORAX

Place the tape only on one side of the chest at the nipple level with anterior end of the tape placed on the midsternal line while posterior end of the tape placed on the spinous process of vertebra i.e midspinal line. Then ask the pt to take deep breath in & hold it. Then find out the expansion of hemithorax from initial & final measurements. In case of **FIBROSIS**, measure the expansion of hemithorax.

>Non-respiratory cause giving rise to poor chest expansion is Ankylosing Spondylitis.

5.VOCAL FREMITUS

-Equal on both sides / Increased / Reduced

Pt is asked to repeat **EK-DO-TEEN/ NINETY NINE/ ONE-ONE-ONE** several times in a constant tone & voice (the depth & intensity of voice remaining same). Place the entire hypothenar eminence of your palm upto the base of the little finger (the rest part of the palm should not touch the chest wall) horizontally over the ICS. Feel the vocal fremitus, comparing the corresponding areas on both sides alternatively. First test in the normal side & then test in the diseased side. Always use the same hand (rt Hand) for examining both sides. Avoid the area of cardiac dullness on the lt side by placing the hand a bit laterally. Start from above downwards in front & back of the chest. Describe the vocal fremitus with respect to different areas of the chest wall i.e in which area it is increased or decreased. Confirm the altered (increased or decreased) vocal fremitus by auscultating for increased vocal resonance, i.e first confirm that the vocal resonance is increased or decreased & then only tell that vocal fremitus is increased or decreased.

TYPICAL DESCRIPTION OF VOCAL FREMITUS
Vocal fremitus is decreased in infraclavicular area.

>VOCAL FREMITUS, PERCUSSION & AUSCULTATION OF THE CHEST ARE DONE ALONG MIDCLAVICULAR LINE ANTERIORLY ,ALONG MIDAXILLARY LINE (UPPER AXILLA, MID AXILLA & LOWER AXILLA) LATERALLY & IN BACK-A.UPPER PART-SUPRASCAPULAR AREA, B.MIDDLE PART-INTERSCAPULAR AREA, C.LOWER PART-INFRASCAPULAR AREA ALONG SCAPULAR LINE.

6.TENDERNESS OF RIBS

-Absent/ Present-Rt/ Lt

Palpate over that areas of the chest wall where the pt complains of pain & look for tenderness by looking to the pt's face.

>Rib pain-Multiple myeloma

7.TENDERNESS OVER ICS

Palpate over the ICS by the tip of your finger.
>Tenderness over ICS is found in empyema thoracis.

8.CROWDING OF RIBS

-Absent/ Present-Right/ Left

Stand at back side of the pt & place your palmar surface of hand over the lateral aspect of the chest with fingers lying over the intercostal spaces. Press

the finger inwards & move them anteriorly in forward & downward direction comparing with the other side for crowding of the ribs.

8.WIDENING OF INTERCOSTAL SPACES

- Absent/Present-Rt/ Lt

Similar procedure as used for crowding of ribs.

III.PERCUSSION

>**VOCAL FREMITUS, PERCUSSION & AUSCULTATION of the chest are performed along MIDCLAVICULAR LINE ANTERIORLY; ALONG MIDAXILLARY LINE (UPPER AXILLA, MID AXILLA & LOWER AXILLA) LATERALLY & IN BACK ALONG SCAPULAR LINE -A.UPPER PART-SUPRASCAPULAR AREA, B.MIDDLE PART-INTERSCAPULAR AREA, and C.LOWER PART-INFRASCAPULAR AREA.**

>**7th ICS** is the **last ICS** along **MCL** while **11th ICS** is the **last ICS** along **scapular line.** There is **no 12th ICS** along **scapular line.**
>Axilla starts from 4th intercostal space.
>***Conventionally percussion is done***

1. Along mid-clavicular line upto **7th** ICS
2. Along mid-axillary line upto **8th** ICS i.e 4th to 8th ICS since the axilla starts from 4th ICS.
3. Along scapular line upto **11th** ICS.

>Middle finger of the lt hand **(PLEXIMETER FINGER)** is applied flatly & firmly on the chest wall over the ICS while the rest of the fingers are lifted off (**NEVER ALLOW THE OTHER FINGERS EXCEPT THE PLEXIMETER FINGER TO TOUCH THE CHEST WALL** because to avoid dampening of the sound by the other fingers). Then the pleximeter finger is percussed with the middle finger **(PLEXOR FINGER)** of the rt hand once or twice. Strike the centre of the second phalanx of the pleximeter finger with the tip of the plexor finger held at an rt angle (to produce a hammer effect) & with the entire movement coming from the **wrist joint**. As soon as the blow is given, the plexor finger is raised immediately (to avold dampening of the vibratory sound thus produced to prevent error in listening). **THE OTHER FINGERS OF THE LEFT HAND SHOULD NOT TOUCH THE CHEST WALL.** The intensity & quality of the sound produced & feeling of resistance imparted to the pleximeter finger should be observed. Rising dullness (higher level of dullness in the axilla as compared to front & back) and shifting dullness should be looked for when pleural effusion is suspected. While percussing, pleximeter finger should be placed symmetrically over the corresponding areas of the chest on either side. While percussing the back, the pleximeter finger is placed obliquely downwards & outwards (with the tip of the pleximeter finger pointing upwards) like the fish bones as the ribs & hence the ICS are so directed i.e ICS are directed obliquely.

SEQUENCE OF PERCUSSION

Start percussion from the healthy side. **CLAVICLES SHOULD BE PERCUSSED FIRST BY DIRECT PERCUSSION.** Then anterior chest wall along MCL, then lateral chest wall along the MAL & at last the back along the scapular line. Lastly, percuss the apex of the lung from the back of the pt. During the percussion of the lateral chest wall (i.e axilla) along MAL, pt's hands are kept over his head. While percussing the back, cross the pt's hands over the knees (or shoulders) & percuss in a bat's wing or fish-bone pattern as you did for palpation.
>Always percuss from above downwards & compare the note on the identical site on the opposite side of the chest.

THREE CARDINAL RULES OF PERCUSSION

1. Percuss from resonant to dull area or more resonant to less resonant area.
2. Pleximeter finger should be placed parallel to the border of the organ to be percussed and the line of percussion should be perpendicular to that arbitary border.
3. Heavy percussion for deeply placed viscera & light percussion for superficial viscera.

FORMAT OF PERCUSSION OVER THE CHEST

A.ANTERIORLY ON THE RIGHT SIDE

1.Conventional percussion
2.Liver dullness
3.Shifting dullness
4.Coin percussion

B.ANTERIORLY ON THE LEFT SIDE

1.Conventional percussion
2.Cardiac dullness
3.Shifting dullness
4.Coin percussion
5.Traube's space percussion

C.BACK

1.Tidal percussion.

>Scapula can be percussed directly with the palmar aspect of the four fingers except thumb.
>First percuss the clavicle over the medial one-third just lateral to its expanded medial end, only with the plexor finger. During the percussion, stretch the overlying skin downwards with the lt thumb so that the percussing finger does not slip over the clavicle. It is light percussion. **DIRECT PERCUSSION OVER THE CLAVICLE GIVES A DULL NOTE IN CASE OF UPPER LOBE CONSOLIDATION.**
>Map out the areas of impaired resonance by percussing from resonant to dull.
>Percussion is done and reported in relation to ICS (while vocal fremitus is reported in relation to different areas of the chest wall).

1.PERCUSSION NOTE

-Normally resonant /Hyperresonant/ Impaired/ Dull/ Stony dull/ Tympanic

>Percussion is done & described in terms of ICS. Percussion is never described in relation to the different areas of the chest wall as done in case of auscultation.
>**TYPICAL DESCRIPTION-THERE IS STONY DULLNESS IN MAL FROM 4th ICS DOWNWARDS.**
>**Typical description in a normal case**-Chest is normally resonant bilaterally.

KRONIG'S ISTHMUS

It is a small area (a band of resonance of 5-6 cm width, connecting the lung resonance on the anterior & posterior chest on each side) in the apex of the lung (supraclavicular area) which is bounded medially by the neck muscles, laterally by the ipsilateral shoulder joint, anteriorly by the clavicle & posteriorly by the trapezius muscle. Kronig's isthmus is elicited by the percussion over the apex of the lung (performed from the back of the pt), and the percussion note is normally resonant. The area becomes dull on percussion in the presence of apical tuberculosis, apical pneumonia & Pancoast's tumor. While percussing this area, the pleximeter finger should be placed over the supraclavicular fossa perpendicular to the clavicle & percuss from medial to lateral side. **FIRST PERCUSS THE KRONIG'S ISTHMUS WHEN PERCUSSING BACK OF THE CHEST.**
>**DULLNESS FOUND DURING PERCUSSION OF LUNG IS DESCRIBED ACCORDING TO THE ICS. FOR EXAMPLE, THERE IS STONY DULLNESS FROM 3rd ICS TO 7TH ICS ALONG MCL.**

2.CARDIAC DULLNESS

-Present in lt parasternal region over 3rd to 5th ICS/ Obliterated (Lost)

3.HEPATIC DULLNESS

-Starts from 5th ICS in rt MCL/ Displaced upwards/ Displaced downwards

4.ELICITATION OF HORIZONTAL FLUID LEVEL

>Done if **HYDROPNEUMOTHORAX** is suspected.
>In sitting position of the pt, percussion is done from above downwards in the front along MCL, lateral chest wallalong MAL & back along scapular line. During percussion from above downwards, a point of dullness is reached in the front, lateral chest wall & back where markings are given by skin pencil. These three points are joined transversely to get a horizontal line encircling the affected chest wall. This is the upper horizontal border of fluid level & is classically found in hydropneumothorax .
>In **HYDROPNEUMOTHORAX**, the change in the note of percussion from above downwards is tympanitic (because of air) to stony dullness which is very much distinct in comparision to pleural effusion where the change in the note of percussion from above downwards is resonant to stony dullness. So the term horizontal fluid level is classically used in hydropneumothorax.

>IF YOU ARE GETTING DULLNESS ON PERCUSSION OVER THE CHEST WALL, THEN YOU HAVE TO DESCRIBE THE FOLLOWING TWO THINGS-
1.WHETHER THE DULLNESS IS SUPRADIAPHRAGMATIC OR INFRADIAPHRAGMATIC WHICH CAN BE DETECTED BY TIDAL PERCUSSION.
2.WHETHER THERE IS ANY SHIFTING OF FLUID WHICH CAN BE DETECTED BY TESTING FOR SHIFTING DULLNESS.

5.TIDAL PERCUSSION

- On deep inspiration, the previous dullness-Persists/ Disappears

Pt sits with forearms crossed in front of the chest & hands resting on the shoulders. Ask the pt to exhale. Then percuss the lung on one side posteriorly along the scapular line till you get dullness. Keeping your finger at the site of dullness, ask the pt to take deep inspiration & hold it. Then percusss again at the site of dullness. If the dullness persists, then the dullness is supradiaphragmatic & if the dullness disappears (i.e resonant note is now obtained over the previous site of dullness), then the dullness is infradiaphragmatic. It is so because if the dullness is infradiaphragmatic, then it will be displaced downwards with inspiration (since the diaphragm goes down during inspiration) & we will get a resonant note at the previous site of dullness & this resonant note is due to expansion of lung during inspiration. But if the dullness is supradiaphragmatic then it will not go down with respiration & will persist there & so the previously obtained dullness persists. Normally, the previously obtained dullness disappears & there is increase in resonance by **4-6cm** during inspiration. The previously obtained dullness also disappears (i.e the normal increase in resonance decreases) in **UPWARD ENLARGEMENT OF LIVER & CHRONIC BRONCHITIS** (infradiaphragmatic dullness). The previously obtained dullness persists (i.e no increase in resonance at all) in **BASAL PLEURISY & BASAL PNEUMONIA** (supradiaphragmatic dullness). Tidal percussion has little practical value.

6.SHIFTING DULLNESS

-Present/Absent

Shifting dullness is performed only when there is an air-fluid level as in hydropneumothorax, & large lung abscess containing air & fluid etc. Shifting dullness is usually performed by percussing along MAL from above downwards & where a dullness is found, the pleximeter finger is kept there. Then the pt is asked to sleep with the disease side upward & healthy side downward so that pleximeter finger remains uppermost (For example,if rt side is affected, ask the pt to lie in lt lateral position). Then wait for 2-3 minute for gravitation of fluid & then percuss again. If shifting dullness is present (as in hydropneumothorax), then the percussion note will become hyperresonant.

>Test for shifting dullness in the chest to exclude **HYDROPNEUMOTHORAX** in all cases of pleural effusion.

8.TRAUBE'S SPACE PERCUSSION

-Tympanitic/ Dulll

SURFACE ANATOMY OF THE TRAUBE'S SPACE

Draw 2 parallel vertical lines, one from the left 6th costochondral junction & another from the 9th rib in MAL. Then connect the 2 lines above from the left 5th costochondral junction to the 9th rib in anterior MAL & below along the lt costal margin. It forms a semilunar space & is tympanic on percussion.

BOUNDARIES OF TRAUBE'S SPACE

On the rt side-Lt lobe of the liver. On the lt side-Spleen, On the above-Lt lung resonance [Lt dome of the diaphragm & lt lung (6th rib)] & On the below-Lt costal margin. Traube's space lies below the cardiac dullness. According to Harrison,the borders of the Traube's space are-6th rib superiorly, the lt MAL laterally and the lt costal margin inferiorly.

CONTENT OF THE TRAUBE'S SPACE

Fundus of the stomach containing air. So in a healthy person, percussion of the Traube's space produces a resonant note.

METHOD OF PERCUSSION OF TRAUBE'S SPACE

The pt lies supine with the lt arm slightly abducted. During normal breathing, this space is percussed across one or more level from its medial to lateral margin i.e from xiphisternum to lt MAL across the 6th & 7th ICS (**BARKUN'S METHOD**).

TRAUBE'S SPACE IS OBLITERATED IN

1. Lt sided pleural effusion
2. Massive splenomegaly
3. Enlarged lt lobe of the liver
4. Full stomach
5. Fundal growth (Carcinoma of fundus)
6. Massive pericardial effusion
7. Achalasia cardia (Often the fundal gas is absent)
8. Situs inversus totalis (Traube's space is present on the rt side)

TRAUBE'S SPACE IS SHIFTED UPWARDS IN

1. Lt diaphragmatic paralysis
2. Lt lower lobe collapse
3. Fibrosis of the lt lung

IV.AUSCULTATION

PRE-REQUISITE FOR AUSCULTATION

Pt should be in sitting position. Stand on the rt side of the pt. Ask the pt to turn his head to lt side & to take deep breath in and out through **CLOSED MOUTH (NOT WITH OPEN MOUTH)** regularly without producing any noise. Demonstrate what you would like the pt to do & then check it visually that he is doing it while you listen to the chest. Then simultaneously auscultate the corresponding area of rt & lt side with diaphragm of the stethoscope firmly applied to the chest wall.
>Do not auscultate over the trachea, clavicle, sternum & scapula.
>Auscultatory findings are described in relation to different areas of the chest wall. For example, coarse crepitation is found in the infraclavicular area.

1.BREATH SOUNDS

-Absent/ Present
>If present-

a.**QUALITY**

1. Vesicular
2. Bronchial- Tubular/ Cavernous/ Amphoric

b.**INTENSITY**- Normal/ Diminished/ Increased

VESICULAR BREATH SOUND

Rustling (like dry leaves blown by wind) in character, intensity & duration of inspiration is more than expiration, no gap between inspiration & expiration. Classical site for hearing vesicular breath sound are infraclavicular, mammary, infra-axillary & infrascapular.
>**NORMAL BREATH SOUND IS VESICULAR IN CHARACTER.**

BRONCHIAL BREATH SOUNDS

Both inspiratory & expiratory sounds are blowig in character, expiratory sound is as long & as loud as the inspiratory sound & usually of higher pitch, pause between expiration & inspiration. Conditions associated with bronchial breath sound will produce quantitative increase in vocal resonance i.e bronchophony & whispering pectoriloquy along with increased vocal fremitus. Classical site for hearing bronchial breath sound are-Over the trachea:-the bronchial breath sound resembles that obtained by listening over the trachea although the noise over the trachea is much louder.
>In bronchial breath sound, the expiratory sound is distinctly heard, long & loud.

TYPES OF BRONCHIAL BREATH SOUNDS

1.TUBULAR

High pitched bronchial breath sound heard in consolidation, collapse with patent bronchus & above the level of pleural effusion. In this case, air does not enter into the alveoli.

2.CAVERNOUS

Low pitched bronchial breath sound classically heard over a superficial big empty cavity (> 2cm in diameter) in the lung connected with a patent bronchus e.g. tuberculous cavity, lung abscess etc.

3.AMPHORIC

Low pitched bronchial breath sound with tones & overtones with a metallic tone which mimics the whistling sound produced by blowing air across the mouth of a small glass bottle, heard over very large cavities e.g. bronchopleural fistula.
>In the exam, tell only bronchial or vesicular. Do not tell-tubular, cavernous or amphoric. But you must know in detail about what are the different bronchial breath sounds & in which diseased conditions these are found so that you can answer if these are asked in the exam.

TYPICAL DESCRIPTION OF BREATH SOUND

1. Typical description in a normal case-Bilateral vesicular breath sound of normal intensity is heard in all areas. Or simply tell- Bilateral vesicular breath sounds are heard in all areas.
2. Breath sound is vesicular & decreased is intensity in infrascapular area.

2.VOCAL RESONANCE

Vocal resonance is auscultatory homologue of vocal fremitus. Pt is asked to repeat **NINETY NINE OR ONE-ONE-ONE** several times in a constant tone & voice (the depth & intensity of voice remaining same). Both sides of the chest are auscultated area by area, comparing with the corresponding sites on the opposite side with diaphragm of the stethoscope. Always say vocal resonance as normal, increased or decreased after comparing with the opposite side. Auscultate from above downwards in the front, sides & back of the chest. It is better to start from the apparently healthy side. Do not auscultate over clavicle, sternum & scapula. Vocal resonance is described with respect to different areas of the chest wall.

INTERPRETATION OF VOCAL RESONANCE

A.**QUANTITATIVE CHANGE**

a.**Normal**

The sound seems to be produced at the **CHEST PIECE** of stethoscope, heard as indistinct rumble & individual syllables are indistinguishable

b.**Diminished/ Absent**

c.**Increased**

Sounds are louder & often more distinct & seems to be nearer to ear than chest piece. Quantitative increase in the vocal resonance is of two types- 1.Bronchophony & 2. Whisperingpectoriloquy

BRONCHOPHONY

Sound seems to appear from the **EARPIECE** of stethoscope giving rise to loud clear sounds but indistinguishable words OR in otherwords, bronchopho-ny refers to an increased vocal resonance which is so loud that it appears that the sound is being produced in the ear pieces of the stethoscope. Describe bronchophony in relation to different areas of the chest wall.

WHISPERING PECTORILOQUY

Pt is asked to whisper & auscultation is carried out. The sound seems to be spoken right **INTO THE AUSC-ULTATOR'S EAR** & is heard clearly or distinctly i.e syllable-by-syllable. Describe whispering pectoriloquy in relation to different areas of the chest wall. Whispering pectoriloquy indicates markedly increased vocal resonance.

>BRONCHOPHONY & WHISPERING PECTORILOQUY ARE CLASSICALLY HEARD OVER CONSOLIDATION.
>IF YOU ARE TELLING THAT VOCAL RESONANCE IS INCREASED, THEN YOU MUST TELL THAT THERE IS PRESENCE OF BRONCHIAL BREATH SOUND & WHISPERING PECTORILOQUY.
>IF YOU ARE TELLING VOCAL FREMITUS IS INCREASED ON PALPATION, THEN YOU MUST TELL THAT VOCAL RESONANCE IS INCREASED ON AUSCULTATION.

B.QUALITATIVE CHANGE

a.AEGOPHONY

It is a high pitched nasal intonation or bleating character imparted to the increased vocal resonance (meaning goat voice). It is classically found over consolidation & sometimes above the level of pleural effusion. Aegophony is audible at the upper level of pleural effusion due to partially collapsed underlying lung. Aegophony is produced by selective transmission of high frequency components of breath sounds.

>ACTUALLY, THE METHOD TO DEMONSTRATE BRONCHOPHONY, WHISPERING PECTORILOQUY & AEGOPHONY IS SAME AS MENTIONED ABOVE. THE BRONCHOPHONY & WHISPERING PECTORILOQUY INDICATES QUANTITATIVE INCREASE IN VOCAL RESONANCE WHILE AEGOPHONY INDICATES QUALITATIVE INCREASE IN VOCAL RESONANCE.

SUMMARY OF INTERPRETATION OF VOCAL RESONANCE

A.**QUANTITATIVE CHANGE**

a.Normal
b.Decreased/ Entirely abolished
c.Increased
1.BRONCHOPHONY-Present/ Absent
2.**WHISPERING PECTORILOQUY**-Present/ Absent

B.QUALITATIVE CHANGE

a.AEGOPHONY

3.ADVENTITIOUS SOUND

- Rhonchi-Present/ Absent
- Crepitation (=Rales=Crackles)
  - Absent
  - Present-Fine/ Coarse
- Wheezes-Present/ Absent
- Stridor-Present/ Absent
- Pleural friction rub-Present/ Absent

>ADVENTITIOUS SOUNDS ARE DESCRIBED IN RELATION TO DIFFERENT AREAS OF THE CHEST WALL i.e AREAWISE. FOR EXAMPLE, THERE IS FINE CREPITATION HEARD OVER INFRASCAPULAR AREA.
>Fine crepitations are found in bronchopneumonia & CHF.

WHEEZES

High pitched musical sound heard from a distance, better heard in expiratory phase, usually associated with rhonchi, indicates small airways obstruction.

STRIDOR

Low pitched crowing sound heard from a distance, better heard during inspiration, indicates larger airways obstruction like larynx, trachea & major bronchus, very common in children. In otherwords, stridor is the noisy breathing produced by turbulent airflow through narrowed airways.

TYPES OF STRIDOR

1.INSPIRATORY STRIDOR

Produced due to obstruction in supraglottic region, e.g Laryngomalacia, retropharyngeal abscess

2.EXPIRATORY STRIDOR

Produced due to obstruction in thoracic trachea, primary bronchi & secondary bronchi, e.g Tracheal stenosis, bronchial foreign body

3.BIPHASIC STRIDOR

Produced due to obstruction in glottis,subglottis & cervical trachea, e.g Laryngeal papilloma, vocal cord palsy, subglottic stenosis

>Types of crepitation in relation to phases of respiration
1.Inspiratory-Early/ Mid/ Late
2.Expiratory

TYPES OF RHONCHI

A.MONOPHONIC

May be inspiratory or expiratory or both & may change in intensity with change of posture. It is produced due to narrowing of a single bronchus by tumor or foreign body (i.e localized obstruction).

B.POLYPHONIC

Particularly heard in expiration & are characteristically found in diffuse airflow obstruction eg. bronchial asthma or chronic bronchitis. They denote dynamic compression of bronchi. This is the most common type of rhonchi where the musical sound contains several notes of different pitch & results from oscillation of many large bronchi at a time. Do not utter the word monophonic & polyphonic in the examination unless you are asked.

PLEURAL FRICTION RUB

Creaking or rubbing, superficial (the sound seems to be very close to the ear), scratching or grating in character heard towards the end of inspiration & just after the beginning of the expiration usually in association with pleuritic chest pain. Best heard at the base of the lungs & at the lower parts of the axillary region (generally heard over the antero-inferior part of the lateral chest wall or over the lower part of the back as the movement of the lung is maximum in these regions). Better heard on pressing the diaphragm of the stethoscope over the chest wall. The rub disappears when breath is held. Sometimes the rub can be felt with the palpating hand when it is called as the **FRICTION FREMITUS**. The sound does not alter after coughing & with change of posture. Press the diaphragm of the stethoscope to note the local tenderness & increase in the intensity of pleural rub

.

4.SUCCUSSION SPLASH(HIPPOCRATIC SUCCUSSION)

-Present/ Absent

This is done if **HYDROPNEUMOTHORAX** is suspected. Ask the pt to sit up & place his hands above his head. Now by percussion, the upper border of dullness is detected in the lateral chest wall along the MAL in sitting position of the pt. Now the diaphragm of the stethoscope is placed on the upper border of dullness & the pt is shaken from side to side vigorously. A splashing sound (like splashing sound of an intact coconut) is audible with every jerk. Sometimes the sound can be heard without stethoscope (unaided ear i.e ear placed over the chest wall & the pt is shaken from side to side). (The stethoscope may be placed on the anterior chest wall). Succussion splash in the chest is **ALWAYS PATHOLOGICAL.**
>In the rt side, succussion splash is always pathological, but in lt side, it may be due to fluid in the stomach.

5.SCRATCH TEST (=SCRATCH SIGN=FRICTION TEST)

-Positive/ Negative

It is done if **PNEUMOTHORAX** is suspected. Diaphragm of the stethoscope is placed on the mid-point of the sternum & is held in position with the lt hand. Then the anterior chest wall is scratched with the fingers of the rt hand at a point equidistant to the lt & rt of the stethoscope alternatively. Start scratching from the lateral aspect and move gradually towards the mid-sternal line. The sound heard is louder when the affected side of the chest wall (having pneumothorax) is scratched.

6.COIN TEST (=BELL TYMPANY)

-Positive/ Negative

1.PREFERRED METHOD

Ask the pt to place an 1 ruppee coin over the upper part of front of the affected side chest & percuss the coin with a second 1 ruppee coin. The examiner stands behind the pt & listens at the back just diametrically opposite to the point of percussion with the diaphragm of the stethoscope. A high-pitched tympanitic or metallic (bell-like) sound will be heard in case of tension pneumothorax. This metallic sound is called as coin sound, bell sound, bell tympany, bruit-de-airain or diatal anvil sound.

2.ALTERNATIVE METHOD

Ask the pt to fix the diaphragm of yours stethoscope over the anterior chest wall while you yourself put a coin in the pt's back & strike with second coin by standing behind the pt.

>Coin percussion is positive in **PNEUMOTHORAX (TENSION PNEUMOTHORAX) & OVER LARGE CAVITIES. Coin percussion is done only when pneumothorax is suspected.**

GASTROINTESTINAL SYSTEM EXAMINATION

I.INSPECTION

A.UPPER GIT

1.LIPS

2.ANGLE OF MOUTH

-Healthy/ Angular stomatitis

3.TEETH

-Chewing surfaces are normal/ Caries

4.GUMS

-Healthy/ Bleeding/ Hypertrophy

5.TONGUE

- **a**.Size (=Bulk)-Normal/ Atrophy/ Hypertrophy
- **b**.Surface-Normal/ Smooth/ Bald
- **c**.Color-Pink/ Pale/ Beefy red
- **d**.Ulcer-Present/ Absent

See the inferior surface, superior surface, tip & margins of the tongue to find out the above abnormality.

6.THE ORAL CAVITY (mucous nenbrane of mouth)

-Moderate in hygiene/ Mouth ulcers

B.ABDOMEN

1.SHAPE OF THE ABDOMEN

-Scaphoid/ Distended or Swollen or Protuberant

2.VENOUS PROMINENCE

- Around umbilicus-Present/ Absent
- At flanks (About mid-axillary line)-Present/ Absent

3.UMBILICUS

- Location-Central (Midway between xiphisternum & symphisis pubis/ Displaced up OR Displaced down/ Displaced to rt OR Displaced to lt
- Inverted/ Everted
- Shape-Circular/ Transversely slit/ Vertically slit

>Transversely slit umbilicus is known as laughing umbilicus.
>Normally, umbilicus lies more or less in the midway between xiphisternum and symphysis pubis. Normally, it is inverted and slightly retracted, and its slit is circular. Umbilicus is everted in any condition giving rise to increased intra-abdominal tension like ascites, ovarian cyst, pregnancy, polyhydramnios, severe gaseous distension etc. Its slit is transverse in ascites and vertical in ovarian cyst.
>**TANYOL'S SIGN**-Downward displacement of umbilicus in ascites.
>Any swelling on one side of the abdomen will push the umbilicus to the opposite side.

4.FLANKS

-Full/ Flat (Empty)

Flanks are full in ascites & flat in ovarian tumor.

5.CONDITION OF SKIN

-Healthy/Scar mark/ Scratch mark/ Yellow discolouration/ Ulcer/ Ecchymosis / Scaly/ Puncture mark/ Shiny

6.ANY LOCALISED SWELLING

7.MOVEMENT OF THE ABDOMEN

-Respiratory movement/ Peristalsis/ Pulsation (epigastrium)
>Adequate in all quadrants in a normal case.

8.HERNIAL ORIFICES

-Inguinal/ Femoral/ Umbilical/ Epigastric/ Incisional
All hernial orifices are intact in a normal case.

9.SCROTUM

-Healthy/ Edematous/ Hydrocele (In nephrotic syndrome)/ Other

II.PALPATION

PRE-REQUISITE FOR ANY ABDOMINAL PALPATION

Always stand on the rt side of the pt. Pt lies in supine position with head supported with a pillow & hands lying by the side of his trunk. Expose the abdomen from xiphisternum to just above the inguinal ligament. Then semiflex the lower limb at hip joint & knee joint to relax the abdominal wall muscles. Turn the pt's head to the lt & ask him to breathe deeply but regularly with **open mouth. SEMIFLEXION OF THE HIP JOINT & KNEE JOINT IS A MUST FOR ALL ABDOMINAL PALPATION.**

A.SUPERFICIAL PALPATION

1.TENDERNESS

-Absent/ Present in_____area or at Mc Burney's point/ Galldder point/ Epigastrium/ Renal angle

2.CONSISTENCY(FEEL)

-Normal elastic/ Tense OR Rigid
>Determine by superficial palpation.

3.DIRECTION OF BLOOD FLOW IN PROMINENT VEINS

a.AROUND UMBILICUS

-Towards/Away from umbilicus

b.ABOUT MID-AXILLARY LINE

-From above downwards/ From down upwards

>**Portal hypertension**-There is periumbilical engorged veins with direction of blood flow away from the umbilicus (Caput medusae).

>**IVC obstruction**-Direction of blood flow is-
1.Above the umbilicus-Upwards & away from umbilicus
2.Below the umbilicus-Towards the umbilicus. In inferior venacaval obstruction, engorged veins are found at the flanks. In general, remember that in IVC obstruction, the flow of blood in engorged veins is from below upwards.

>**SVC obstruction**-The engorged veins are found above the umbilicus with flow of blood from above downwards.

METHOD TO DETERMINE THE PRESENCE OF DILATED & TORTUOUS VEINS ON ABDOMINAL WALL/CHEST WALL

Ask the pt to sit with the legs hanging from the bed (never examine in lying down position) & ask him to cough or to perform the Valsalva maneuver. Coughing makes the veins prominent transiently while the Valsalva retains the prominence of veins so long as the maneuver is continued. Proper light is necessary (pt fecing the window) for demonstration.

METHOD TO DETERMINE THE DIRECTION OF BLOOD FLOW IN DILATED & TORTUOUS VEINS ON ABDOMINAL WALL/CHEST WALL

Make the veins prominent by aforementioned method. Then place two index fingers of both hands side by side on the **tributary free** long segment (one inch or more) of the prominent vein. Then gently press & move the lower index finger away, thus emptying part of the vein. Then remove the lower index finger & see whether the vein remains empty or becomes full again. If the vein remains empty, the direction of blood flow is from above downwards as venous valve prevents retrograde flow & if the vein remains full, the direction of blood flow is from below upwards. If you find that the engorged

vein refills from both direction (i.e from above as well as below) then it is the rapidity of refilling which determines the direction of flow i.e the direction of blood flow is towards the direction of rapid refilling.

>It is preferable to choose a vein below the umbilicus for demonstration of venous flow in engorged abdominal wall veins. Engorged & tortuous veins always indicate some underlying pathology.
>**NORMALLY, THE DIRECTION OF BLOOD FLOW IN THE VEINS ABOVE THE UMBILICUS IS FROM BELOW UPWARDS & IN THE VEINS BELOW UMBILICUS IS FROM ABOVE DOWNWARDS (i.e AWAY FROM UMBILICUS).**

VISIBLE VEINS VERSUS ENGORGED VEINS

Sometimes, veins are visible normally in thin built persons (often in fair-skinned individuals) & are usually present at the skin level i.e flushed with the skin. But the engorged vein is bit raised from the skin surface. Palpate the vein lightly by rt index finger & draw your inference. Visibility of a vein does not mean that it is pathological engorgement & moreover, tortuosity indicates its pathological nature.

4.FLUID THRILL

-Present/ Absent

Pt lies in supine position. Do not semiflex pt's lower limb at hip joint & knee joint (as you are doing for other abdominal palpations) to relax the abdominal wall muscles because, for fluid thrill, there is no need to relax the abdominal wall, rather you have to make the abdominal wall tense by putting pt's hand as described subsequently. Either the pt or a third person (but never ask the examiner to put his hand) will put his ulnar border of rt hand vertically (along the longitudinal axis) over the abdomen in the midline (to prevent transmission of vibration through the abdominal parieties). Then place your lt palm over the lt flank & sharply tap or flick the rt flank with your rt index finger. A fluid thrill is felt by your lt palm as a definite impulse. You can tap the lt flank & feel the impulse over rt flank, but for this you have to stand on the lt side of the pt. 1 to 2 liter of fluid is required for this. USG can detect even 100 ml of peritoneal fluid.

5.PULSATION

-Transmitted/Expansile

6.PARIETAL EDEMA

-Present/Absent

EXAMINATION FOR PARIETAL EDEMA

Edema of the parieties (eg.abdominal wall) is assessed by pinching the skin at the flanks with rt thumb & rt index finger for few seconds **(AT LEAST FOR 5 SECONDS)**. [Other mrethods-Press the diaphragm of the stethoscope or the tip of fingers of the abdominal parieties or thigh for a few seconds (AT LEAST FOR 5 SECONDS) & look for pitting edema there.]
>Parietal edema is usually found in anasarca caused by nephritic syndrome.

7.MAXIMUM GIRTH OF THE ABDOMEN IN cm

a.At umbilicus
b.Below umbilicus
c.Above umbilicus
Measure with a measuring tape & express in cm.

>Do not tell this in the exam. Tell this only if you are asked.
>This is done to know whether the ascites or intestinal obstruction or any other cause of abdominal swelling which are treated are improving (i.e responding to treatment) or not.

8.SPINO-UMBILICAL DISTANCE IN cm

Measure the distance between umbilicus & anterior superior iliac spine with a measuring tape & express in cm.

B.DEEP PALPATION

PRE-REQUISITE FOR ANY ABDOMINAL PALPATION

Always stand on the rt side of the pt (you will be failed if you examine the pt by standing on the lt side of the pt). Ask the pt to lie down in supine position with head supported with a pillow & hands lying by the side of his trunk. Expose the abdomen from xiphisternum to just above the inguinal ligament. Then semiflex the knee joint to relax the abdominal wall muscles. Turn the pt's head to the lt & ask him to breathe slowly, smoothly & deeply but regularly with **open mouth. SEMIFLEXION OF THE HIP JOINT & KNEE JOINT IS A MUST FOR ALL ABDOMINAL PALPATION.** No anterior abdominal wall muscles are inserted to the lower limb, but still we flex the lower limb to relax the anterior abdominal wall, because the **"Tensor Fascia Lata"** of the thigh is attached superiorly to the inguinal ligament which is nothing but the lower inwardly curved portion of the external oblique aponeurosis (which is an anterior abdominal wall muscle). So if you do not flex the lower limb during abdominal palpation, the Tensor Fascia Lata will pull the inguinal ligament down thereby making the anterior abdominal wall tense.

1.LIVER

a.Enlarged__cm below the costal margin at rt MCL (Measurement taken during normal expiration).

b.Tenderness-Tender/Nontender

While examining for liver tenderness, look to pt's face for grimacing due to pain.

c.Margin-Sharp (palm leaf)/ Rounded/ Irregular

Usually **a soft liver** has **round margin**, & **firm or hard** liver has **sharp margin**. Margin may be irregular in cirrhosis of liver. Soft liver can not have sharp margin i.e it must have round margin. Hard liver can not have round margin i.e it must have sharp margin.

d.Consistency-Soft/ Firm/ Hard

e.Surface-Smooth/ Granular/ Nodular/ Irregular

Normal liver is soft in consistency & has round margin.

f.Moves with respiration

g.Left lobe-Enlarged/ Not enlarged

Rt lobe of the liver is palpated by keeping the hand lateral to the Rt. rectus abdominis muscle while the Lt. lobe is palpated in the midline.

h.Upper border of liver dullness-Starts from rt___ICS at MCL

NOTE- It is mandatory to tell that the liver is enlarged instead of liver is palpable, because it is obvious that a enlarged liver is always palpable, but a palpable liver is not always enlarged. That means there are certain conditions like Emphysema, subdiaphragmatic abscess etc. in which an unlarged liver is displaced downwards so that it becomes palpable. So a palpable liver may or may not be enlarged, but an enlarged liver is always palpable. A palpable liver may or ay not be pathological, but an enlarged liver is always pathological. But it is mandatory to tell that the spleen is palpable instead of spleen is enlarged, because spleen is palpable only when it is enlarged 2 times than its normal size. That means a palpable spleen is always enlarged & pathological.

PERCUSSION OF UPPER BORDER OF LIVER

Start percussion from above downwards in the rt chest along the rt MCL. It is a heavy percussion as upper border of liver lies under cover of the rtlung. Place the pleximeter finger in the rt 2nd ICS parallel to the arbitary upper border of liver & the line of percussion will be perpendicular to that border. Normally when percussed, **UPPER BORDER OF LIVER DULLNESS STARTS FROM RIGHT 5 TH ICS ALONG MCL, RIGHT 7 TH ICS ALONG MAL & RIGHT 9 TH ICS ALONG SCAPULAR LINE**. Upper border of liver dullness is displaced upwards in upward enlargement of liver.

i.Any pulsation-Felt/ Not felt

METHOD TO PALPATE PULSATILE LIVER

Stand on the rt side of the patient. Ask the pt to lie down in supine position & semiflex his hip & knee joint as in any abdominal palpation. Place your rt palm over the rt hypochondrium (never put your palm over epigastrium) & the lt palm over the back, just opposite the rt palm (as in bimanual palpation of kidney). Ask the pt to hold his breath after taking deep inspiration. Then look from the side & observe the separation of the hands along with expansile pulsation of the liver.
>Tell liver is not enlarged. Don't tell-Liver is not palpable. In pediatrics, tell liver is palpable if it is enlarged.

METHODS TO PALPATE LIVER

A.CONVENTIONAL METHOD

Pre-requisites are mentioned earlier. Place the flat of the rt palm firmly over the rt iliac fossa parallel to the rt subcostal margin (or the arbitary lower border of liver) & lateral to the rt rectus abdominis muscle. At the height of inspiration press the fingers firmly inwards & upwards (don't press your hand very hard). The **radial border of the rt index finger** will slip over the lower border of the liver, if it is enlarged. At each phase of expiration, glide your rt palm over the abdomen & place the rt palm at a 2 cm higher level from the previous level (never lift your rt palm from the abdomen at any cost). In this way go on palpating upwards in search of the lower border of the liver. Now palpate the epigastrium for the lt lobe of the liver. Look to pt's face for any pain (Tender Hepatomegaly).

B.PREFERRED METHOD

Pre-requisites are mentioned earlier. Place both hands side by side flat on the anterior abdominal wall in the rt subcostal region lateral to the rt rectus abdominis muscle with the fingers pointing towards the ribs. If any resistance is felt, move the hands further downwards until the resistance disappears. The pt is then asked to breathe deeply & at the height of the inspiration press the finger upwards & inwards. The process is repeated from lateral to medial side to trace the lower border of the liver as it passes upwards to cross from rt hypochondrium to epigastrium. When the hand is moved downwards, the loss of resistance demarcates the lower border of liver.

C.ALTERNATIVE METHOD

Pre-requisites are mentioned earlier. The rt hand is placed flat in the rt iliac fossa with the fingers directing upwards, lateral to the rt rectus abdominis muscle. At the height of inspiration, the hand is pressed firmly inwards & upwards.With the inspiration the tips of the fingers will slip over the edge of the liver, if palpable. The lt hand may be placed in the lower part of the rt chest wall posteriorly. Now palpate the surface, feel the consistency etc.as a routine.

D.DIPPING METHOD

This method is used in ascites. Pre-requisites are same as mentioned above. Give two sharp taps in quick succession at the rt subcostal region by the tip of the four fingers (except thumb) of the rt hand by flexing the fingers at the metacarpophalangeal joint. The sudden thrust causes sudden & rapid displacement of fluid & gives a tapping sensation over the surface of the enlarged liver which is comparable to patellar tap. It is better to start palpation from rt iliac fossa for dipping method. Similar method is used for palpating spleen in ascites.

>Never forget to palpate the lt lobe of the liver, to percuss the upper border of the liver & to palpate bimanually for liver dullness.

2.SPLEEN

a.Palpable___cm below the costal margin rt MCL
b.Tenderness-Tender/ Nontender
c.Consistency-Soft/ Firm/ Hard
d.Surface-Smooth/ Irregular
e.Splenic notch-Felt/ Not felt
f.Moves with respiration
g.Inability to insinuate the finger between the mass & costal margin
h.Palpable splenic rub-Present/ Absent (for this, pt must breathe in & out deeply)

>**TELL SPLEEN IS NOT PALPABLE. DON'T TELL-SPLEEN IS NOT ENLARGED.**

>**MASSIVE SPLENOMEGALY**-Spleen is enlarged > **8 cm** below the left costal margin or its drained weight is ≥ 1000gm.

❖ **SPLENOMEGALY**

1. Mild-Above the umbilicus or **upto 5 cm**
2. Moderate-At the umbilicus or **5 to 8 cm**
3. Severe-Below the umbilicus or **> 8 cm**

❖ **SPLENOMEGALY**-

1. Tip enlargement of 1 to 2 cm
2. Moderate enlargement of 3 to 7 cm
3. Marked enlargement of 7+ cm

METHODS TO PALPATE SPLEEN

A.BIMANUAL PALPATION

Pre-requisites are same as mentioned in liver palpation. Stand on the rt side of the pt. Ask the pt to breathe in & out slowly, smoothly & deeply but regularly with **open mouth.** Palpate the spleen with the fingertips of the rt hand starting from the rt iliac fossa. Glide your rt hand upwards & laterally towards the lt hypochondrium at **2cm** intervals with each respiration till fingertips of the rt hand reach the lt costal margin. As the lt costal margin is approached, place your lt hand firmly over the lt costal margin posterolaterally & press it forward & medially. Start well out to the lt costal margin & gradually move more medially if spleen is not found. At the height of inspiration, release pressure on the examing hand so that the fingertips slip over the lower pole of the spleen, confirming its presence & surface characteristics. It is better to palpate the spleen with the fingertips but few clinicians prefer to use the radial border of the rt index finger to palpate the spleen where the radial border of rt index finger is placed parallel to the lt costal margin. **Contracting rectus abdominis may be confused with palpable spleen**.

B.If a spleen is not palpable (or is a just palpable spleen) by the method mentioned above, turn the pt to rt lateral position & ask him to relax upon your lt hand which is now supporting the lower ribs with the lt hip & knee flexed & palpate the spleen by the same palpatory method mentioned above (palm lying flat) while the pt is breathing in & out deeply. The examiner's lt hand should remain over the lowermost rib cage posterolaterally on the lt side as mentioned above.

C.In case of just palpable spleen, finally stand on the lt side of the pt facing the foot end of the bed. Palpate the spleen by the **HOOKED FINGERS** (curling the fingers of the examining hand) of the lt hand below the lt costal margin as the pt breathes in deeply. Hooking method may be done from the lt side in sitting position of the pt.
>If the spleen is not palpable by method **A**, go for method **B** & then for method **C**. Method A & B may be called bimanual palapation. While palpating spleen, do not be hasty & rash, rather show endurance as a just palpable spleen will definitely touch your finger at the height of inspiration.

D.DIPPING METHOD

This method is used in **ASCITES** & is performed similarly as mentioned in liver palpation in ascites.

3.KIDNEY

-Ballotable/ Not ballotable
>Prerequisities are same as mentioned in liver palpation.

RIGHT KIDNEY

Place the rt hand horizontally in the rt lumbar region anteriorly & the lt hand is placed posteriorly in the rt loin (bimanual palpation). Ask the pt to take deep breath in while you push forwards with the lt hand & press the rt hand backwards, upwards, & inwards. A firm mass may be felt between the two hands (if kidney is enlarged). Next a sharp tap is given by the lt hand placed in the loin. The anteriorly placed rt hand now feels the kidney & the kidney then falls back (by gravity) on the posterior abdominal wall which is felt by the lt hand. This is ballotment.

LEFT KIDNEY

Palpate from the rt side, not from the lt side. The rt hand is placed anteriorly in the lt lumbar region while the lt hand is placed posterior in the lt loin. Ask the pt to take deep breath in & then press the lt hand forwards & the rt hand backwards, upwards & inwards. Lt kidney's lower pole, when palpable is felt as a round firm swelling between both rt & lt hands (i.e bimanually palpable) & it can be pushed from one hand to the other (i.e balloting).

>Assess the size, surface & consistency of a palpable kidney.
>A kidney lump is bimanually palpable & bimanually ballotable.

4.ANY OTHER MASS

1. Site
2. Size
3. Surface
4. Skin over it
5. Edge
6. Extension

>Tell only if present. Otherwise don't tell.

5.HERNIAL ORIFICES

- Inguinal/ Femoral/ Umbilical/ Epigastric/ Incisional
- Effect of coughing

>All hernial orifices are intact in a normal case.
>In the exam, you must examine the ingunal hernial site & tell that all hernial sites are intact. In all abdominal cases, it is mandatory to examine the hernial sites, at least the inguinal hernial sites.
6.TESTIS (both sides)

III.PERCUSSION

1.GENERAL NOTE OF THE ABDOMEN

-Dull/ Tympanic

2.LIVER DULLNESS/LIVER SPAN

It is the vertical distance between the uppermost & lo-wermost points of hepatic dullness. It is detected by percussing the upper & lower borders of liver at the rt MCL. **Percussion of the upper border of liver**-Start percussion from above downwards in the rt chest along rt MCL (You may start percussion fron the 5th ICS onwards as the upper border border of liver lies below the 5th rib?). It is a heavy percussion (as the upper border of liver lies under cover of the right lung). Place the pleximeter finger in the rt 2nd ICS parallel to the arbitary upper border of liver & the line of percussion will be perpendicular to that border. **Percussion of the lower border of liver-** Start percussion from below upwards i.e from rt iliac fossa to rt hypochondrium along the rt MCL. It is a light percussion. Place the pleximeter finger parallel to the rt subcostal margin & the line of percussion will be perpendicular to that margin? Mark the dullness with a pen above and below and then measure the distance between the points with a measuring tape or measure the distance with fingers and convert into cm by multiplying with 1.5?
>The normal liver span is **12-15cm** in adult. Normally the upper border of liver dullness is present in rt **5th** ICS along MCL, in rt **7th** ICS along MAL & in rt **9th** ICS along scapular line. Serial measurement is helpful to detect shrinkage or enlargement.
>Tell about the liver span only when you are asked. Do not tell as a routine.
>In emphysema and pneumothorax, the liver is displaced downwards without being enlarged.

3.SPLENIC DULLNESS

METHOD TO PERCUSS FOR SPLENIC DULLNESS

It is accomplished by any of the following three methods described by Nixon, Castell or Barkun.

1. NIXON'S METHOD

The pt is placed on the rt side so that the spleen lies above the colon and stomach. Percussion is begun at the lower level of the pulmonary resonance and proceeds diagonally along a perpendicular line toward the lower midanterior costal margin. The upper border of dullness is normally 6 to 8 cm above the costal margin. Dullness > 8 cm in an adult is presumed to indicate splenic enlargement.

2. CASTELL'S METHOD

With the pt supine, percussion in the lowest ICS in the anterior axillary line (8th or 9th) produces a resonant note if the spleen is normal in size. This is true during expiration or full inspiration. A dull percussion note on full inspiration suggests splenomegaly.

3. BARKUN'S METHOD (PERCUSSION OF TRAUBE'S SEMILUNAR SPACE)

As mentioned in the examination of respiratory system.

4.SHIFTING DULLNESS

-Present/ Absent

PRINCIPLE OF SHIFTING DULLNESS

When there is fluid in the abdominal cavity, the fluid causes the intestines (bowel loops) to float up i.e they come to lie beneath the anterior abdominal wall when the pt is in supine position. These bowel loops contain gas which gives a resonant note when the the anterior abdominal wall is percussed. So there is no need to semiflex pt's lower limb while percussing for shifting dullness.

PROCEDURE OF SHIFTING DULLNESS

Pre-requisites are same as mentioned above except that there is no need to semiflex pt's lower limb at hip joint & knee joint (as you are doing for other abdominal palpations) to relax the abdominal wall muscles. Now palpate the abdomen for any visceromegaly (by dipping method). If any viscous is enlarged, try to avoid percussion over them. Then starting from the epigastrium, percuss in the midline from above down-wards & note the maximum point of tympanicity which is usually somewhere around the umbilicus (**In the examination, you may avoid this step**). Now percuss laterally at **1 cm** intervals to that side where there is no enlargement of organs from the maximum point of tympanicity noted in the midline, keeping the pleximeter finger parallel to long axis of abdomen. When you get a dull note, go on percussing upto the end of the flank. Then turn the pt to other side keeping the pleximeter finger at the flank so that the pleximeter finger on the flank occupies the highest point of the pt's body. Now wait for **30 TO 60 SECONDS** for the intestine to float up and then percuss the flank where pleximeter finger is placed which will be tympanitic now.Continue percussing from the flank back towards the midline which will be dull now. So the dullness in the flank changes to tympanitic note & tympanitic note in the midline changes to dull note. Do in both sides. **Never allow the other fingers except the pleximeter finger to touch the abdominal wall while percussing**. It is the shifting of dullness and not the shifting of resonance.

>In case of pregnancy and large ovarian cyst, the central part abdomen is dull (in contrast to ascites where the central part is tympanic) while the flanks are tympanic (in contrast to ascites where the flanks are dull).
>Shifting dullness is the diagnostic sign of free fluid in the abdomen i.e ascites.
>In ascites, fluid thrill may be absent.
>Shifting dullness is absent when there is accumulation of very large quantity of fluid.
>Ascites is clinically recognized only when the amount of fluid present in the peritoneal cavity exceeds 150 ml.
>In loculated ascites (found in TB), ther is no shifting dullness.

UNILATERAL SHIFTING DULLNESS=BALANCE'S SIGN

This is found in the splenic rupture wherein the blood present in the lt flank (i.e near the spleen) clots & doesn't shift to rt side in rt lateral position, but the blood present in the rt side (hemoperitoneum) shifts to lt side in lt lateral position.

5.PUDDLE SIGN

-Positive/ Negative

>First percuss the abdomen in supine position where you get a tympanitic note in the midline. Now place the pt on hands & knees i.e **KNEE-ELBOW POSITION** for **5** minutes & percuss over the lowest part of the suspended (near umbilicus) abdomen which now reveals a dull note due to shifting of fluid.
>This sign is actually elicited by **AUSCULTO-PERCUSSION** i.e placing the bell of the stethoscope over the lowest part of the suspended abdomen in knee-elbow position & then repeatedly flicking near the flank with the finger while the stethoscope is gradually moved towards the opposite flank. In a positive case, there is marked change in the intensity & character of the percussion note as the stethoscope leaves the lowest (**PUDDLING**) zone. In order to confirm the validity of the test, the pt is asked to sit up while the stethoscope is held on most dependent area & flicking of the abdominal wall is repeated. If now the percussion note becomes loud & clear, the initial impression of puddling of fluid is considered to be correct.

IV.AUSCULTATION

1.BOWEL SOUND

:____bowel sounds/ minute

>Place the stethoscope over Epigastrium/ Right iliac fossa & keep it there for 1 minute. Normal bowel sounds are intermittent, low or medium pitched gurgles mixed with occasional high-pitched tinkle.
>In mechanical intestinal obstruction, frequent, loud, lowpitched gurgles (borborgymi) are heard often interspersed with high-pitched tinkles occurring in a rhythmic pattern with peristalsis. As a whole, the peristaltic sounds are exaggerated. In paralytic ileus, abdomen is silent (bowel sounds are not heard).

2.VENOUS HUM

-Present/ Absent
Do not tell in examination if not asked.

3.SPLENIC RUB

-Present/ Absent
Do not tell in examination if not asked.

4.RENAL ARTERY BRUIT

-Present/ Absent
Do not tell in examination if not asked.

V.PER-RECTAL EXAMINATION

>Boggy fluctuant swelling in the rectovesical pouch or Pouch of Douglas is due to collection of free fluid in ascites.
>Tell only if you have done this, otherwise do not tell falsely.It is usually not done.

VI.SPECIAL SIGNS

NERVOUS SYSTEM EXAMINATION

CNS-It consists of **brain, spinal cord & the first two cranial nerves**, while the remaining **cranial nerves & the spinal nerves** constitute the **PERIPHERAL NERVOUS SYSTEM.**

I.HIGHER FUNCTION EXAMINATION

PRE-REQUISITE FOR HIGHER FUNCTION EXAMINATION

HIGHER FUNCTION IS TESTED ONLY WHEN THE PATIENT IS FULLY CONSCIOUS & IS NEVER TESTED IF THE PATIENT HAS ALTERED SENSORIUM SINCE TESTING OF HIGHER FUNCTION REQUIRES Pt'S CO-OPERATION & WITHOUT Pt'S CO-OPERATION, IT IS IMPOSSIBLE TO TEST THE HIGHER FUNCTIONS. SO IN UNCONSCIOUS, SEMICONSCIOUS, STUPOROUS & COMATOSE Pt, NEVER EXAMINE THE HIGHER FUNCTIONS.

1.LEVEL OF CONSCIOUSNESS

a.Pt is conscious & co-operative

CONSCIOUS

Relates to a person who is alert, attentive & co-operative. Actually it is a state of awareness of one's self & environment.

b.Stupor/ Confusion/ Drowsy/ Semicoma/ Coma/ Akinetic mutism (=Persistent vegetative state)/ Locked-in syndrome (=De-efferented state)

CONFUSION

1. Fluctuation in awareness, associated with agitation, fright, confusion i.e disorientation. It denotes incapacity of the pt to think with customary speed & clarity. The pt is conscious, but often talks irrelevantly. It is associated with misperception of environment, hallucination, delusion etc.
2. The confused pt is usually subdued, not inclined to speak & is physically inactive.
3. A state of confusion that is accompanied by agitation, hallucinations, tremor & illusions (misperceptions of environmental sight, sound or touch) is termed delirium, as typified by delirium tremens from alcohol or drug withdrawal.
4. In some instances, the apparent confusional state may be due to an isolated deficit in mental function such as an impairment of language (aphasia), loss of memory (amnesia) or lack of apprehensions of spatial relations of self or the external environment (agnosia).
5. Confusion is also a feature of dementia in which case the chronicity of the process distinguishes it from the acute encephalopathy.
6. Confusion definition-Confusion is a mental & behavioural state of reduced comprehension, coherence & capacity to reason.

DROWSY

1. Pt appears to be in normal sleep but can not easily be awakened & once awake, he tends to fall asleep despite verbal stimulation or clinical examination.
2. Pt cannot be fully aroused, but may open eyes & show tongue after vigorous painful stimulation which is brief & incomplete.

STUPOROUS

1. Pt is not aware of surroundings, but responds to painful stimuli (pinching or supraorbital pressure) by groaning or simple withdrawal of the stimulated part of the body.
2. Give sternal rub & supraorbital pressure to distinguish between stuporous pt from comatose pt.
3. Sternal rub is given by rubbing examiner's knuckles of right hand (Flexed proximal interphalangeal joint of fingers).
4. Supraorbital pressure is given by applying painful stimuli by pressing upward the medial side of the orbit above the medial canthus (i.e medial aspect of the upper margin of the orbit) of two sides simultaneously with both thumbs i.e lt thumb for the rt side & rt thumb for the lt side. Look for facial grimacing.

COMA

Pt shows no psychologically meaningful response to external stimuli or internal need of any kind & the pt is deeply unconscious.

LOCKED-IN SYNDROME = DE-EFFERENTED STATE

- Pt is awake, but is completely immobile (i.e can't make any volitional movement) & can't produce speech to indicate that he is awake. Pt is able to communicate only by verticak eye movement, lid elevation & blinking which remain unimpaired.
- Cause- It is usually due to bilateral ventral pontine lesion due to infarction or hemorrhage which transects all descending coticospinal tracts & coticobulbar tracts. EEG is normal.
- Patient
  1. Is quadriplegic (bilateral damage to corticospinal tract in ventral pons)
  2. Is unable to speak & incapable of facial movements (involvement of corticobulbar tracts)
  3. Has limited horizontal eye movements (bilateral involvement of nuclei & fibres of 6th cranial nerve)
  4. Has intact vertical eye movements & blinking (supranuclear ocular motor pathways are spared)
  5. Has preserved consciousness (reticular formation is not damaged)

AKINETIC MUTISM
(=PERSISTENT VEGETATIVE STATE)

>Now a day, the degree of coma or the level of consciousness is assessed by Glasgow coma scale.

GLASGOW COMA SCALE (GCS)

It has 3 components-**E, V & M.**

A.EYE OPENING (E)

RESPONSE	SCORE
Spontaneus	**4**
To loud voice (To speech)	**3**
To painful stimuli	**2**
No response	**1**

EXPLANATION

1. If the pt opens eyes spontaneously to observe surroundings, record: Spontaneous
2. If the eyes are not spontaneously open, call the pt by name: If the eyes open then record: To speech
3. If the eyes do not open to the name, apply sternal rub (with the knuckles): If eyes open, then record:To pain
4. If the eyes still have not opened, record: None
5. If the eyes are closed because of swelling, record: C

B.VERBAL RESPONSE (V)

a.VERBAL RESPONSE (NONINTUBATED Pt)

RESPONSE	SCORE
Oriented & talks	**5**
Disoriented & talks (Confused) Pt is not oriented to time, place & person.	**4**
Inappropriate words	**3**
Incomprehensible sounds (i.e the sounds can not be understood)	**2**
No response	**1**

b.VERBAL RESPONSE (INTUBATED Pt)

RESPONSE	SCORE
Seems able to talk	**5**
Questionable ability to talk	**3**
Generally unresponsive	**1**

EXPLANATION

1. Address the pt by name: "Mr……., tell me where you are."Ask his full name & address-What day it is, month, year? If the patient answers correctly, then record: Oriented
2. If the pt answers incorrectly, record: Confused
3. If oriented only in some respects, then expand on this in observation coloumn.
4. If reply is not related to the question, then record: Inappropriate
5. If the pt's reply is incoherent, record: Incoherent
6. If the pt makes no reply, record: None
7. If the pt has a tracheostomy, record: T

C.BEST MOTOR RESPONSE (M)

RESPONSE	SCORE
Obeys verbal command	**6**
Localizes pain	**5**
Flexion withdrawal to pain (Withdraws to pain)	**4**
Abnormal flexion posture (***decorticate rigidity***)	**3**
Abnormal extension posture (***decerebrate rigidity***)	**2**
No response	**1**

DECEREBRATE POSTURE

Extended elbows & wrists with arms pronated. The lesion lies at the brainstem level, disconnecting cerebral hemispheres from brainstem.

DECORTICATE POSTURE

Flexed elbows & the wrists with arms supinated. It is seen in bilateral hemispherical lesion above midbrain. Decorticate rigidity is seen on the hemiplegic side in humans after hemorrhages or thromboses in the internal capsule.

EXPLANATION

1. Ask the pt to squeeze both of your hands, offering index & middle fingers. If the pt's eye are closed, you may lightly touch his hands to let him know where your fingers are, but do not put your fingers into his hands or you may elicit a reflex grasp (not released when the pt is asked to do so).
2. If the pt is able to squeeze your hands with one or both of his hands, record: Obeys command. If not, apply sternal rub (with your knuckles). If the pt's arm reaches upto the site of the painful stimulation, record: Localises pain. If the pt's arm does not localize the site of the pain, then apply nail bed pressure to one finger. Now if the pt's arm withdraws from the source of the pain, then record: Withdraws to pain, if the pt's arm abnormally flexes record: Abnormal flexion, if the pt's arm extends record: Extension & if the pt's arm makes no movement at all, record: None. Test both arms, but record only best response. Abnormal flexion consists of adduction at the shoulders, flexion at the elbows, pronation of the forearms and flexion of the wrist & fingers.

COMA SCORE=E+M+V

>GCS is useful in assessing the level of consciousness in a pt with head injury.
>Severe head injury is stated to be present if score is **≤ 7** (i.e 7 or < 7) & persists for > **6** hours.
>Scores < **4** indicates coma, scores **4 to 9** indicates stupor & scores > 9 excludes coma. Scores > 11 indicate 5-10% chance of death while scores 3 or 4 indicate 85% chance of dying.
>According to GCS, coma is defined as not opening eyes, not obeying commands & not uttering understandable words.
>Less than or equal to 8 are in coma. Greater than or equal to 9 are not in coma. **8 IS THE CRITICAL SCORE.**

INTERPRETATION	SCORE
Best total score	15
Mild injury	13 to 15
Moderate injury	9 to 12
Severe injury	**≤** 8

INTERPRETATION	SCORE
Maximum score	15
Minimum score	3
Fully conscious	15
Deeply comatose	3

>All pts in coma should be asked to open their eyes & look up & down, because in locked-in syndrome, only these movements are spared.

ABBREVIATED COMA SCALE (AVPU)

RESPONSE	SCORE
Alert	**A**
Responds to **V**ocal stimuli	**V**
Responds to **P**ain	**P**
Unresponsive	**U**

2.BEHAVIOUR

-Co-operative

3.EXPRESSION/APPEARANCE

-Pleasant/ Disturbed/ Apathetic/ Agitated/ Confused

Do not tell in the examination unless asked.

4.ORIENTATION WITH TIME, PLACE & PERSON

-Well oriented/ Disoriented

a.**TIME**
Ask the pt to estimates approximate time without looking at watch. Now it is day or night?

b.**PLACE**
Ask the pt about where where he is now.

c.**PERSON**
Ask the pt to recognize his family members or to identity of his nearby relatives or neighbours

d.SELF
Ask the pt's name, age, address & qualifications.

5.MEMORY

-Intact
Ask about those things which you know & the pt is also expected to know.

a.**IMMEDIATE MEMORY (=WORKING MEMORY)**

It can be tested by saying a list of 3 items & then asking the pt to repeat the list immediately. Ask the pt to count backwards from 7 to 1.

b.RECENT MEMORY (=SHORT TERM MEMORY =EPISODIC MEMORY)

Ask the patient about-
- Day of the week?
- Name of the month?

(-Others:-
- Date of the month?
- Ask the pt to recall what he read in newspaper yesterday or seen on television yesterday?/ Ask about things happened in past 3-4 days.
- Ask the pt to repeat the days of the week backwards or to spell INDIA backwards.
- Who examined the pt earlier in the day ?
- Give the pt a telephone number & ask the the number after a minute or so**).**

c.REMOTE MEMORY (=LONGTERM MEMORY=PAST MEMORY)

You should ask about the things in which the pt is interested & the things that everybody knows like-
- Name the recent festivals observed.

(-Others:-
- When was the supercyclone occurred in Orssa?
- When was the tsunami occurred in India?
- Ask him the date of Independence Day of India.
- Who was the first prime minister of India?
- Who won the cricket world cup in 1983?**)**

6.INTELLIGENCE

-Normal
>Intelligence is the total assessment of judgement, reasoning, arithematic ability etc. & is tested by-
a.Calculation ability by serial 7-substraction test i.e serial substraction of 7 from 100-100,93,86,79,72, …… or serial substraction of 3 from 20.
b.Ask the pt about what he will do if he sees a house on fire or a stampede & addressed envelope lying on the road in front of his house.
c.Insight-Observe his awareness about the illness for which he has been admitted.
d.Reasoning-Can he tell the difference between poverty & dishonesty, child & dwarf etc.
e.Abstract thinking-Ask him the meaning of proverbs like all that glitters is not gold etc.
f.Attention-It is tested by tapping the finger with repetition of a particular number.

7.SLEEP

-Adequate/ Inadequate

8.SPEECH

-Normal

A.APHASIA (Dysphasia)-Sensory/ Motor/ Global

B.DYSARTHRIA-
Cortical/ Cerebellar/ Bulbar/ Pseudobulbar

C.DYSPHONIA

EXAMINATION OF APHASIC PATIENT

Ask the pt his name. If he keeps mum, now write "show your tongue" on a white paper & show the paper to the Pt. If he protrudes his tongue, then it is a case of motor aphasia (i.e comprehension is perfect & word blindness is not present). If he does not protrude the tongue, probably we are dealing with a case of snsory aphasia or global aphasia.

APHASIA

Defect in higher center with difficulty in language function. It is of following types-

a.MOTOR APHASIA (= BROCA'S APHASIA = EXPRESSIVE APHASIA)

Pt is unable to speak although there is no paralysis of faciolingual muscles. Motor ahasia means pt will not talk whatever you do.

b.SENSORY APHASIA (=WERNICKE'S APHASIA = RECEPTIVE APHASIA)

It is of following types

1.WORD DEAFNESS

Though the pt can hear the sound, he is unable to analyse its meaning & so can not speak.

2.WORD BLINDNESS

The pt can see that something is written, but he can not recognize the words. His mother language appears to be a foreign language to him.

c.GLOBAL APHASIA

This is a combination of sensory & motor aphasia i.e there is defective comprehension as well as production of speech.

DYSARTHRIA

Defect in articulation due to neuromuscular or muscular disorders resulting in impaired coordination faciolingual muscles.

DYSPHONIA

Disorder of phonation due to abnormality of vocal cord.
Know in detail about aphasia.

9.GAIT

-Normal/ Hemiplegic gait/ Could not be tested

HEMIPLEGIC GAIT (SPASTIC GAIT)

This is seen in hemiplegic pts after recovery. The pt walks on a narrow base. The hemiplegic limb is held stiffly and does not flex at the knee & hip. While the pt drags his foot, the foot is raised from the ground by tilting the pelvis to the healthy side & the leg is swung forward forming a semicircle or an arc known as circumduction of the leg. The outer side of the sole of the shoe is worn (as there is plantiflexion on the affected side). The affected arm is adducted at the shoulder & flexed at the elbow, wrist and fingers & does not swing naturally. The hemiplegic gait is essentially a plastic gait.

>**HOOVER'S SIGN**-*It is a sign of hysterical paraplegia*. The patient lies supine & is asked to raise one leg against resistance.In a normal person, the back of the heel of the contralateral leg is pressed firmly down in the bed (examiner's hand is placed under the heel), and the same is true in a patient with organic hemiplegia when he tries to lift the paralysed or weak leg against resistance.**This is absent in hysteria.**

10.HANDEDNESS

-Righthanded/ Lefthanded/ Ambidextrous

Give something instantaneously (i.e before the pt is prepared for anything) to catch hold & see in which hand he first picks up the thing.

>**Typical description-HIGHER FUNCTIONS ARE NORMAL OR HIGHER FUNCTIONS COULD NOT BE TESTED BECAUSE OF ALTERED SENSORIUM.**

II.CRANIAL NERVES

>Cranial nerves are teted only when the pt is fully conscious,except 7th and 3rd, 4th & 6th cranial nerves which can be tested even if the pt is unconscious or the pt has altered sensorium.
>Test in both sides-Rt & lt.
>The bare minimum for cranial nerve examination-Check visual fields, pupil size & reactivity, extraocular movements, and facial movements.

1.OLFACTORY NERVE

Precautions-

1.Exclude local changes like nasal catarrh.
2.Examine each nostril separately.
3.Pt's eyes are clo9sed during the test.
4.Avoid irritating substances like ammonia (as they stimulate the trigeminal nerve).

>Ideal objects (non-irritating substances) for olfaction are oil of peppermint, oil of cloves, tincture of asafoetida or oil of lemon. But in the exam, the students should test olfaction by common bedside substances like soap, toothpaste, fruits etc.

ADVICE-No need to test this nerve in the exam & hence no need to take materials needed to test this nerve. But you should know in detail about how to test this nerve & what are the abnormalities of this nerve caused by different diseases & the olfactory pathways of sensation whcih can be asked in the exam.

2.OPTIC NERVE

a.VISUAL ACUITY

1.DISTANT VISION

One eye is tested at a time (Other eye is closed by the hollow of the palm). Ask the pt to count the beams in the ceiling or blades in the fan or to read what is written in the wall of ward. Ideally distant vision should be tested by the Snellen's chart as done in the eye department.

2.NEAR VISION

One eye is tested at a time (Other eye is closed by the hollow of the palm). Ask the pt to count the fingers of the examiner's hand held in front of him or to read newspaper. If finger counting is not possible, put torch light on the eye & examine for PL (Perception of light)/ PR (Projection of rays). pt should wear the spectacles during the bedside test.

b.VISUAL FIELD BY CONFRONTATION TEST (CONFRONTATION PERIMETRY)

-Same as that of you/ Restricted_____quadrant

Sit in front of the pt at adistance of **1 METRE** at the same level. To test the field in the rt eye, ask the pt to cover the lt eye with the hollow of his lt palm & to look steadily at your lt eye. Cover your rt eye with the hollow of your rt hand & gaze steadily at the pt's right eye. The pt should not move his head. Hold up the index finger of your lt hand in a plane midway between the pt's face & your face (at first) almost a full arm's length to the side (i.e periphery). Keep moving your finger & bring it nearer to the midline until you first perceive the moving finger. Ask the pt to say when he first sees the movement of the finger, making sure all the time that he steadily fixes gaze at your eye. If the pt fails to see the finger, keep moving it nearer till the pt sees it. Test the four quadrants of the field in **EACH EYE SEPARATELY** by moving finger upward, downward, to rt & to lt, using the extent of your own field for comparision. Preferably remove both the examiner's & the pt's spectacles (if any) prior to testing field by confrontation method. (First test the acuity of vision.)
>In a non-cooperative pt, a shiny object is moved from the periphery to the centre & one has to ascertain whether the pt is able to see it OR move your hand quickly towards pt's face & observe the reflex blinking of both the eyes **(MENACE REFLEX)** as confrontation method is not possible here. This method can also be applied in a pt who is unable to sit on the bed.

c.COLOR VISION

Pt can distinguish red, green & orange color/ can't
>Roughly, color vision is assessed by asking the pt to tell the color of his shirt or pant, room wall, ceiling fan, bedsheet etc.

ADVICE-No need to test for color vision in the exam & hence no need to take materials needed to test color vision. But you should know in detail about how to test color vision & what are the abnormalities of color vision caused by different diseases which can be asked by the examiner.

3.III, IV & VI NERVE (IMPORTANT)

All these three nerves are tested simultaneously.

A.PTOSIS

-Present/ Absent
>Ptosis means drooping of upper eyelid, where the drooped upper eyelid covers the pupil. But in a normal individual, the upper eyelid covers only part of the upper part of the cornea but not the pupil.

TESTS FOR PTOSIS
(Method to test the power of the LPS muscle of the upper eyelid)-

1.FIRST STEP

Stand in front of the pt face to face & ask him to look upwards or elevate the upper eyelid voluntarily.

2.SECOND STEP

Now push down the frontal belly of occipitofrontalis muscle of forehead by your lt hand (it is done to eliminate the elevating action of the occipitofrontalis on the upper eyelid). Again ask the pt to look upwards.

3.THIRD STEP

If the pt can elevate the upper eyelid, now you may apply little resistance by your rt index finger over the upper eyelid & ask the pt to look upwards again. Compare with the other side again.

4.If the pt can not elevate the uooer eyelid voluntarily, it is useless to do the next steps.

B.OCULAR MOVEMENTS

-Normal/ Restricted in particular direction

>REMEMBER THAT THE RECTI MUSCLES ARE ELEVATORS & DEPRESSORS ALONE WHEN THE EYE IS IN ABDUCTION (LATERALLY) & OBLIQUE MUSCLES ACT SIMILARLY WHEN THE EYE IS IN ADDUCTION (MEDIALLY).

>Both eyes open, pt's head in neutral position, pt fixes his gaze on examiner's index finger & reports if double vision occurs while following the movement of the finger held at **60 cm** away. The pt is instructed to

follow the moving finger with his eyes & not to move his head. Move the finger-

1. Above his head in the midline-SR & IO of both eyes.
2. Below his head (finger kept at the level of his chest) in the midline-IR & SO of both eyes.
3. Laterally to the lt-LR of lt eye & MR of rt eye
4. Laterally to the rt-MR of lt eye & LR of rt eye
5. Above his head but placed laterally-SR of same side (lateral side) eye & IO of opposite eye
6. Below his head but placed laterally-IR of same side (lateral side) eye & SO of opposite eye
7. Straight ahead-All extra ocular muscle

>Check whether the pt describes diplopia in any direction of gaze. True diplopia almost always resolves with one eye closed.

C.EXAMINATION OF PUPIL

1.SIZE _____mm

METHOD TO DETERMINE THE SIZE OF THE PUPIL

Pt lies supine in bed. Hold your torch light parallel to the bed & then put light on the examining eye in such a way that light beam falls tangentially on the eye. See the the pupil & note its size (Take an approximate measurement). If you put light vertically on the eye, the pupil will contract & you can not determine the actual size of the pupil. That is why light is thrown tangentially on the eye to determine the pupil size.

>The size of the normal pupil varies between 3-5 mm. If < 3mm, it is called miosis & if > 5mm, it is called mydriasis. Normally, pupils are circular & regular in outline, and equal in size. **PINPOINT PUPIL is 1 mm OR LESS in diameter.**

2.SHAPE

-Circular/ Pinpoint/ Vertically oval

METHOD TO DETERMINE THE SHAPE OF THE PUPIL

Hold your torch light parallel to the ground & then put light on the examining eye in such a way that light beam falls tangentially on the eye. See the pupil & note its shape.

>Pinpoint pupil is seen in organophousphorous poisoning, opium poisoning, pontine hemorrhage, carbolic acid poisoning etc.

3. LIGHT REFLEX (=PUPILLARY LIGHT REFLEX = PUPILLARY REFLEX =REACTION TO LIGHT)

- Reacting (R)/ Sluggish (S)/ None (N)/ Eye closed (C)

>Both optic & occulomotor nerves are tested by light reflex.

a.DIRECT LIGHT REFLEX

-Intact/ Abolished (Lost)

Pt is asked to look straightforward at a distant object & the light is thrown suddenly from the periphery (to avoid accommodation reflex) & then the light is taken back immediately. The pupil constricts promptly. For direct light reflex, the non-testing eye should be closed by the hollow of the other palm. Each eye is tested separately. Direct light reflex should be tested preferably in a dark room. Pencil torch with good power of illumination is used. Constriction of pupil to which the light shown is called direct light reflex & constriction of the other pupil is called consensual light reflex. For direct light reflex, afferent is optic N of the same side & efferent is occulomotor N of the same side. Light reflex is consensual i.e the light information from onre eye reaches the brainstem via optic N & returns to both eyes through occulomotor N of their respective sides causing both pupils to constrict. Light reflex is a brainstem mediated reflex since the efferent pathway consists of fibres arising from Edinger-Westphal nucleus situated in the midbrain & these fibres are carried along the occulomotor N. Since light reflex is a brainstem reflex, cortical lesions don't abolish it i.e light reflex is intact in cortical blindness & is not abolished in cortical blindness.

b.CONSENSUAL LIGHT REFLEX (=INDIRECT LIGHT REFLEX)

-Intact/ Abolished (Lost)

Pt is asked to look straightforward at a distant object & the light is thrown suddenly from the periphery (to avoid accommodation reflex). Place your hand with ulnar border resting on nose like a curtain to avoid spillage of light to the other eye. Both the eyes are kept open. When light falls on one eye, observe the pupilary constriction of the other eye. Each eye is tested separately. For consensual light reflex, afferent is optic N of the other side & efferent is occulomotor N of the same side.

>You can test both direct & indirect light relexes simultaneously by keeping ulnar border of the lt hand on the nasal bridge (to avoid spillage of light to opposite eye) & the light is thrown suddenly from the periphery by holding a torch in the rt hand & the light is then taken back immediately. Look at the eye on which light falls for direct light reaction & the opposite eye for consensual light reaction.

c.SWINGING LIGHT REFLEX

Do not tell in the exam. No need to test this swinging light reflex in the examination. But you should know in detail about how to test for swinging light reflex & what are the abnormalities of swinging light reflex caused by different diseases.

d.RELATIVE AFFERENT PUPILLARY DEFECT

4.ACCOMODATION REFLEX

-Intact/Lost

The pt is asked to look at a distant object. Then ask him to look at your finger which is gradually moved toward the bridge of the nose & observe for miosis (Bilateral) & convergence of eyeball.

5.CILIOSPINAL REFLEX

-Intact/Lost

Dilation of the normal pupil when the skin of the neck is pinched. It is due to reflex excitation of the pupil-

dilating fibres in the cervical sympathetic. The response is abolished by lesions of the cervical sympathetic & sometimes by medullary, cervical & upper thoracic spinal cord lesion. Do not tell about the cliospinal reflex in the exam, but you must know in detail abot this reflex so that you can answer if at all you are asked.

D.STRABISMUS

>Look for lateral rectus palsy due to 6th nerve palsy in hemiplegia or due to raised intracranial pressure.
>Tell in the exanination only when you are asked. Otherwise do not tell. But you have to know in detail about this so that you can answer if you are asked in the examination.

E.NYSTAGMUS

Tell in the exam only when you are asked. Otherwise do not tell. But you have to know in detail about this so that you can answer if you are asked in the exam.

F.DIPLOPIA

1. Monocular
2. Binocular-Homonymous/ Heteronymous

Tell in the exam only when you are asked. Otherwise do not tell. But you have to know in detail about this so that you can answer if you are asked in the exam.

4.TRIGEMINAL NERVE (IMPORTANT)

A.SENSORY FUNCTION

-Intact/ Lost

Ask the pt to close his eyes. Check the light touch sensation with a wisp of cotton in the territories supplied by each division of trigeminal nerve independently, comparing rt with the lt. Also test for pain & temperature.

1.OPHTHALMIC DIVISION

Supplies skin of upper eyelid, forehead, scalp as far as vertex & medial part of the skin of the nose upto nosetip. **Tip of the nose**

2.MAXILLARY DIVISION

Supplies skin of lower eyelid, upper lip, upper cheek (Malar areas) & adjacent areas of nose, anterior part of the temple. **Sides & alae of the nose**

3.MANDIBULAR DIVISION

Supplies skin of lower part of the face, lower lip, lower jaw except over angle, upper 2/3rd of lateral surface of the auricle, temporal area, sides of the head.

B.MOTOR FUNCTION

-Intact/ Lost

1. Note the symmetry of the temporal fossa i.e suprazygomatic region & the angle of the jaw to note the bulk of the temporalis & masseter respectively. Paralysis of the temporalis & masseter results in hollowing of the temporal fossa & flattening of the angle of the jaw respectively.
2. Ask the pt to clench his teeth. Then inspect & palpate the masseter at the angle of the mandible & temporalis above the zygoma on both sides & estimate their bulk & symmetry. Paralysed muscle will be less prominent while active muscle stands out.
3. Test for both medial & lateral pterygoid, myelohyoid & anterior belly of diagastric by asking the pt to open his mouth against resistance applied at chin by the examiner.
4. Lateral pterygoids are also tested by asking the pt to open his mouth & to move the lower jaw from side to side against the examiner's resistance. Weakness of the pterygoids causes the jaw to deviate towards the paralysed side on opening the mouth due to the action of the normal pterygoids.

C.CORNEAL REFLEX (=LID REFLEX)

-Intact/ Impaired/ Lost

Ask the pt to look medially. Then approach from the lateral aspect of the eye & very lightly touch the cornea at its conjuctival margin with a wisp of damp (moist) cotton wool which is twisted into a fine hair. If the reflex is present, there will be simultaneous closure of both the eyes. Closure of the test side eyelid is called direct corneal reflex while closure of the eyelid of the nontesting eye is called consensual corneal reflex. Both the eyes should be tested one after another. The cornea is stimulated from the side to avoid menace reflex (Reflex closure of the eyes if an object is brought to the pt directly from the front). Avoid touching the eyelashes. If the pt is apprehensive, then first touch the conjunctiva to allay his fear & then touch cornea.

>In the absence of cotton, blowing a puff of air into each cornea will serve the purpose. This reflex is also called **CONJUNCTIVAL REFLEX.**
>**Corneal Reflex: Afferent-V_1 i.e Ophthalmic division of Trigeminal nerve, Efferent-Facial (VII) nerve**
>Frequent use of contact lenses abolishes this reflex.
>Failure of the either side of the face to contract-V_1 lesion. Failure of only one side to contract-VII leson. Absent corneal reflex can be an early & objective sign of sensory trigeminal lesion.

D.JAW JERK (Pons)

-Intact/ Impaired/ Lost

Ask the pt to open the mouth partially. Then place your lt index finger in the groove under the lower lip. Tap the index finger in a downwards with polnted end of the knee hammer. The normal response is slight & consists of sudden closure of the mouth. This reflex is sometimes absent in health. The jaw jerk is increased in UMN lesions above the 5th cranial nerve nucleus, e.g in pseudobulbar palsy or multiple sclerosis.

E.BLINK REFLEX=GLABELLAR REFLEX= ORBICULA-RIS OCULI REFLEX

Percussion over the supraorbital ridge results in bilateral contraction of the orbicularis oculi muscle. Here, the afferent is trigeminal nerve & the efferent is facial nerve.

5.FACIAL NERVE (IMPORTANT)

CORTICAL CONNECTIONS OF CRANIAL NERVE NUCLEI

All cranial nerve nuclei are under cortical control through corticonuclear fibres i.e pyramidal tract fibres. All the cranial nerve nuclei receive bilateral pyramidal tract supply except the lower part of the 7th cranial nerve nuclei which receive pyramidal fibres from the opposite side i.e from opposite cerebral hemisphere. Cortical control of hypoglossal nucleus is contralateral i.e from opposite cerebral hemisphere. The trochlear nucleus receives ipsilateral fibres i.e from the same side cerebral hemisphere, but the LMN from the trochlear nucleus cross to the opposite side & innervate the opposite eye i.e the trochlear nerve decussates & crosses to the opposite side before innervating its target superior rectus muscle. So in case of ipsilateral cortical lesion, the contralateral eye is affected. All other nuclei are influenced by both cerebral hemispheres but the fibres to the abducent nerve are predominantly crossed.

CORTICAL CONNECTIONS OF FACIAL NERVE NUCLEI

There are two Facial nerve nuclei- one on the rt side & one on the lt side. Each Facial nerve nucleus has two parts-Upper part & Lower part. Pyramidal tract fibres to the upper part of the Facial nerve nucleus on each side come from both cerebral hemispheres i.e upper part of the Facial nerve nucleus has bilateral pyramidal tract supply. But pyramidal tract fibres to the lower part of the Facial nerve nucleus on each side come from contralateral cerebral hemisphere only i.e lower part of the Facial nerve nucleus has unilateral & contralateral pyramidal tract supply. Lower motor neuron from the upper part of the Facial nerve nucleus supplies the muscles of the ipsilateral upper part of the face & lower motor neuron from the lower part of the Facial nerve nucleus supplies the muscles of the ipsilateral lower part of the face. Hence, in Hemiplegia, the contralateral lower part of the face is affected which has only unilateral & contralateral pyramidal fibres supply while the upper part of the face escapes which has bilateral pyramidal fibres supply.

A.INSPECTION

EFFECTS OF FACIAL NERVE PARALYSIS

>The affected side of the face loses its expression. The nasolabial fold is less pronounced. The furrows of the brow are smoothened out. The eye is more widely open than the other and mouth is drawn towards the healthy side. The food collects between the teeth and gum. The saliva and any fluid the pt drinks escape from the affected angle of the mouth. There is loss of salivation & loss of lacrimation.
>Look for upper part of the face-Involved/ Escaped. Observe the face for any asymmetry, epiphora, flattened nasolabial fold (Nasolabial Fold-Intact/ Flattened) & deviation of angle of mouth to one side. Observe the symmetry of blinking & eye closure, presence of any tics or spasms of the facial muscle & spontaneous movements of the face, particularly the upper & lower facial muscles during actions such as smiling.

B.MOTOR FUNCTION

1.FOREHEAD FURROWING (OR EYEBROW RAISING)

Ask the pt to wrinkle his forehead or ask him to look at your index finger which is placed above his head after keeping his head fixed-Tests frontal belly of occipitofrontalis

2.EYE CLOSURE

Ask pt to close both eyes forcibly while you try to open the eyelids by your fingers (both eyes must be examined for comparision) -Tests orbicularis oculi

3.FROWNING

Ask the pt **to frown**-Tests corrugator superciliaris

4.TEETH SHOWING

Ask the pt to show his upper teeth-Tests levator angulis oris, zygomatic major & minor, depressor anguli oris, buccinator & risorius

5.WHISTLING

Ask the Pt. to whistle. Ask the pt to purse his lips-Tests orbicularis oris & buccinator

6.CHEEK BLOWING OUT

Ask the pt to blow out his cheek or purse his lips-Tests only orbicularis oris

7.PLATYSMA

Ask the pt to retract & depress the angle of mouth.While doing this, folds of platysma may be seen.

>Facial nerve supplies all the muscles of the face & scalp except the levator palpebrae superioris (LPS).
>In unconscious pt, give painful stimuli by pressing upward the medial side of the orbit above the medial canthus (i.e medial aspect of the upper margin of the orbit) of two sides simultaneously. Look for facial grimacing & facial muscle paralysis.
>There may be apparent deviation of the tongue to the healthy side on protrusion.

METHOD TO TEST FACIAL MUSCLES TONE IN HEMIPLEGIA

Turn the Pt. to one side & observe for dribbling of the saliva from the corners of the mouth. There will be hypotonia of facial muscles of that side from which saliva dribbles down from the mouth.
***>IN UNCONSCIOUS PATIENT, 7th CRANIAL NERVE & 3rd, 4TH & 6TH CRANIAL NERVES (TESTED BY OCULOCEPHALIC REFLEX) CAN BE TESTED*.**

C.TASTE SENSATION OF ANTERIOR 2/3 OF TONGUE

-Intact/ Impaired/ Lost

>Usually not tested in the final MBBS practical exam. & there is no need to take sugar, quinine tablets etc. to the exam. Tell only if you have tested it. Otherwise tell-Taste sensation is not tested.
>**1.**Sugar solution **2.**Salt solution **3**.Sour solution **4.**Bitter solution
>Ask the pt to close his eyes & open the mouth first. Then pull out the tongue with a gauze piece. Then test samples are put on the tongue one by one & each time mouth is washed & then only a new sample is put. Bitter sample is tested at last. Don't

move the tongue inside. Pt should not talk. Ask the pt to identify the sample (Pt should interpret the result) by pointing to the written test card).
>Sensations perceived by the tongue are sweet at tip, our at margins, bitter at the back & salt by any part of the tongue.

6.VESTIBULOCOCHLEAR NERVE

A.HEARING TEST-TUNING FORK OF 256 HZ

1. WEBER TEST
2. RINNE'S TEST

>Usually not tested. But you have to know detail about all the tuning fork tests along with their interpretation so that you can answer when asked in the examination.
>Tuning fork is essential for the final MBBS practical exam to demonstrate Weber's test, Rinnie's test & vibration sensation.

B.OCULOCEPHALIC REFLEX (=DOLL'S EYE MOVEMENTS= DOLL'S HEAD MOVEMENTS)

Stand on the head end of the bed. Grasp the pt's head with both hands, using the thumbs to hold the upper eyelids open gently, and firmly rotate the pt's head from side to side through 70^0, and then from passive neck flexion to passive neck extension. Observe the motion of the eyes. The pt's eyes tend to remain in the straight ahead position despite these passive movements of the head, a phenomenonlike that found in some children's dolls i.e the pt's eyes tend to deviate in he opposite direction to the induced movement. This doll's head ocular movement depends on intact vestibular reflex mechanisms & is thus a test of the peripheral sense organs like labyrinths & otoliths, and their central connections in the brainstem, including the vetibular nuclei, the medial longitudinal fasciculi & the efferent pathway through oculomotor, trochlear & abducent nerves & their nuclei. So lesions in these structures can be recognized during doll's head test by the presence of disturbances in ocular movements. Disturbances in ocular movements in oculocephalic reflex are found in abducent nerve palsy, oculomotor nerve palsy, lesions of brainstem, deep metabolic comaetc. In most pts with drug-induced coma, doll's head ocular movements are intact.

7.GLOSSOPHARYNGEAL NERVE

Usually not tested.

A.PHARYNGEAL REFLEX (=GAG REFLEX)

-Bilateral normal response/ Absent in rt or lt side

B.TASTE SENSATION OF POSTERIOR 1/3 OF TONGUE

-Intact/ Lost

8.VAGUS NERVE

A.PALATAL REFLEX (PALATAL MOVEMENT)

The pt is placed facing the light with his mouth open (A tongue depressor is introduced for the better visualization of the palete). The position of the soft palate on both sides and that of the uvula are noted. Then ask the pt to say **AAH**. Observe the elevation of the soft palate on both sides & the elevation of the uvula.

UNILATERAL PALATAL PARALYSIS

The palatal arch on the affected side is at a lower level than on the healthy side. On saying AAH, the uvula is pulled to the healthy side by the normal palate. There is little or no movement of the affected palate i.e the affected side palate fails to rise as in normal case.

BILATERAL PALATAL PARALYSIS

Whole soft palate remains motionless on both sides.

>Observe the position & symmetry of the palate and uvula at rest & with phonation. In a normal case, there is bilateral equal movement.

B.HOARSENESS OF VOICE

-Present/ Absent

Ask the pt his name or address & observe for the hoarseness of voice.

C.COUGH

-Normal/ More nasal OR Bovine (i.e explosive nature of the cough is lost)
Ask the pt to cough for the demonstration of bovine cough.

BOVINE COUGH

A characteristic feature of organic laryngeal paralysis is cow-like cough i.e bovine cough which results from the loss of the explosive phase of the normal coughing due to failure of the vocal cords to close the glottis.

D.GAG REFLEX

Touch the posterior wall of pharynx on each sideone after another with a piece of cotton wrapped on a broomstick & note its reflex contraction.

INTERPRETATION

1. Normally, there is bilaterally symmetrical contraction of pharynx. The reflex is normally absent in normal individuals.
2. This reflex is absent on the side of the lesion of the 9th & 10th cranial nerves (LMN type of palsy).
3. Exaggerated gag reflex is seen in pseudobulbar palsy (UMN type of palsy).
4. If on eliciting the gag reflex, the pt is able to feel the tickling sensation, but there is no reflex contraction of the pharynx, then only the 10th cranial nervre may be affected & that the 9th cranial nerve is intact. However, it is very rare to see this type of lesion (involvement of the 10th & sparing of the 9th cranial nerve) clinically.

>**Afferent-Glossopharyngeal (IX) nerve, Efferent-Vagus (X) nerve**

9.SPINAL ACCESSORY NERVE

-Intact/ Paralysed-Lt/ Rt

A.TEST FOR STERNOMASTOID

1.INDIVIDUAL STERNOMASTOID

Stand in front of the pt. Test the lt sternomastoid by asking the pt to rotate the head to the rt side against the examiner's resistance offered by placing his hand against the rt side of the chin & viceversa. Compare both the sides. In a normal person, the sternomastoid muscle on the side opposite to the direction of the head movement stands out prominently.

2.BOTH STERNOMASTOIDS

Ask the pt to press the chin downwards with mouth closed against the examiner's resistance. Both the sternomastoids will become prominent which can be corroborated by both inspection & palpation of the muscles. In bilateral paralysis of the sternomastoid muscles, head tends to fall back.

B.TEST FOR TRAPEZIUS

Stand behind the pt. Ask the pt to elevate his shoulders against the downward pressure applied on his shoulders by the examiner while standing behind the pt. First demonstrate elevation of shoulders to the pt & then press both the shoulders down from behind.

10.HYPOGLOSSAL NERVE

-Intact/ Paralysed-Lt/ Rt

1. While the tongue is within the oral cavity, observe for wasting & fasciculation.
2. Ask the pt to protrude his tongue as far as possible & look for any deviation & tremor. The pt may not be able to protrude the tongue much beyond the teeth in presence of paralysis.
3. Ask the pt for in & out movement of tongue, lick the each tooth with tongue.
4. Press against the tongue from outside when the pt is asked to press the tongue against the cheek & feel for the strength of contraction.
5. Assess hypokinesia by asking the pt to say lah, lah, and lah as quickly as possible & to make rapid in & out, & side-to-side movements of the tongue.
6. In 12th nerve paralysis, tongue deviates to the side of paralysis on protusion due to unopposed action of the normal genioglossus. The pt may not be able to protrude the tongue much beyond the teeth.

>TYPICAL DESCRIPTION-ALL THE CRANIAL NERVES ARE INTACT.

III.MOTOR FUNCTION

-Tested in upper limb, lower limb & trunk both in the rt & lt side.

1.BULK OF THE MUSCLE (=NUTRIRION OF THE MUSCLE)

-Normal/ Atrophy or Wasting/ Hypertrophy

NUTRITION OF MUSCLE IS ASSESSED BY

A.INSPECTION

Inspect for atrophy or wasting of the muscle, flattening of overlying skin or hollowness over the area, prominent knuckles or bony prominences, prominent interosseous gutters in hand or foot, prominent extensor or flexor tendons in hand or foot.

B.PALPATION

Normal muscle feels elastic. Atrophied muscles are small, soft & flabby on palpation.

C.MEASUREMENT

Measure the girth of the specific muscle by a measuring tape from a fixed bony point & compare it with the other side. For the upper limb the fixed bony point is the olecranon process of the elbow & for the lower limb it is the tibial tuberosity. The difference in the circumference (comparing with the opposite side) will give objective evidence of wasting or hypertrophy. Measure the following circumferences-

1.MID UPPERARM CIRCUMFERENCE:10 cm above the olecranon
2.MID FOREARM CIRCUMFERENCE:10 cm below the olecranon
3.MID THIGH CIRCUMFERENCE-18 cm above the superior border of the patella
4.MID LEG CIRCUMFERENCE-10 cm below the tibial tuberosity
(Examine big muscles like biceps, quadriceps plus small muscles of the hand & foot.)

>Note the distribution of the nutritional change i.e predominantly proximal or distal or both proximal & distal.

2.TONE OF THE MUSCLE

-Tone of the muscles around___joint is-Normal/ Hypotonic/ Hypertonic-Spasticity or Rigidity

METHODS TO ASSES THE MUSCLE TONE

1. CLASSICAL METHOD

Muscle tone is tested by measuring the resistance to passive movement of a relaxed limb. Pts often have difficulty in relaxing during this procedure, so it is useful to distract the pt to minimize active movements. Ask the Pt. to relax & go flabby. Passively flex & extend each joint, do this slowly at first & then more rapidly to get a feel of muscle tension. Always compare with the opposite side while assessing the tone. Pt must be fully relaxed while assessing the tone.

- **UPPER LIMB**

  Test tone in the shoulder, elbow & wrist joint. In the upper limbs, tone is assessed by rapid pronation & supination of the forearm & flexion & extension at the wrist.

- **LOWER LIMB**

  Test tone in the hip knee & ankle joint. In the lower limbs, while the pt lies supine, the examiners hands are placed behind the knees & rapidly raised. With normal tone, the ankles drag along the bed surface for a variable distance before rising, whereas increased tone results in an immediate lift of the heel off the surface.

2. ATTITUDE OF THE PT

By seeing the attitude or decubitus, one can say that the flexor tone is increased in the upper extremity & extensor tone is increased in the lower extremity on the affected side of the hemiplegic pt.

3. Hypotonic muscles are abnormally soft to palpation.
4. If a limb falls like a log of wood when lifted up & realeased i.e it behaves as if the limb doesn't belong to the pt, then hypotonia is diagnosed.
5. Ask the pt to outstretch the upper limbs & spread the fingers. Then the hypotonic limb may assume an abnormal posture i.e hyperextended at elbow, hyperpronated at forearm, flexed at wrist & hyperextended at fingers at metacarpophalangeal joints which is known as dinnerfork deformity.

a.HYPERTONIA

>Muscles feel stiff & there is diminished range of passive movement.
>Hypertonia is of 3 types-spasticity (pyramidal tract lesion), rigidity (extrapyramidal tract lesion) & paratonia or gaganhalten.

1.SPASTICITY

1. Always seen in UMN lesion & it takes sometime for the spasticity to develop
2. Tone is of clasp-knife in type i.e hypertonia is felt maximally at the beginning or at the end of passive movement. There is initial resistance to movement followed by no resistance.
3. Hypertonia is marked in flexor muscles of upper limbs & extensor muscles of lower limbs i.e in antigravity muscles.
4. Usually associated with brisk tendon reflexes, clonus, positive Babinski's sign & classical pattern of weaknesss.
5. Involuntary movements are not seen.

2.RIGIDITY

1. Seen in extrapyramidal lesion.
2. Tone is of lead pipe or cogwheel in type

1.LEAD PIPE RIGIDITY

Uniform resitance is felt throughout the entire range of passive movement as if bending a lead pipe. Found in lower limb & trunk in Parkinsonism.

2.COGWHEEL RIGIDITY

Regular intermittent break in resistance during whole range of passive movement is felt due to the presence of static tremor (as if a lever is rubbing on the teeth of a cogwheel). It is best observed in wrist joint. Found in upper limb in Parkinsonism.

3. Hypertonia is marked in both the upper & lower limb equally i.e the flexor muscles & extensor muscles of all the 4 limbs are affected equally.
4. Deep tendon reflexes are normally elicited & clonus is absent.
5. Plantar reflex is flexor.
6. Frequently associated with bradykinesia, static tremor & postural instability. Reflex rigidity is the muscle spasm in response to pain eg. Neck rigidity in meningitis, card-board rigidity in peritonitis.

3.PARATONIA (=GAGANHALTEN)

Pt apparently opposes examiner's attempts to move his limb. Found in bilateral frontal lobe damage, cerebrovascular disease.

b.HYPOTONIA

Muscles feel soft & flabby & there is increased range of passive movement.

METHOD OF TESTING THE TONE OF THE FACIAL MUSCLES IN HEMIPLEGIA

Turn the pt to one side & observe for dribbling of the saliva from the corners of the mouth. There will be hypotonia of facial muscles of that side from which saliva dribbles down from the mouth.

>Decreased tone is most commonly due to LMN or peripheral nerve disorders. Increased tone may be evident as spasticity (resistance determined by the angle & velocity of motion-Corticospinal tract disease), rigidity (similar resistance in all angles of motion-Extrapyramidal disease), or paratonia (fluctuating changes in resistance-Frontal lobe pathways or normal difficulty in relaxing). Cogwheel rigidity, in which passive motion elicits jerky interruptions in resistance, is seen in Parkinsonism.

3.POWER OF THE MUSCLE (STRENGTH OF THE MUSCLE)

A.Power in the upper limb is__grade
B.Power in the lower limb is__grade

PREREQUISITE

While testing power of the muscles, expose the muscle fully. Ask the pt to contract the muscle against your resistance. See the muscles contracting. Feel the strength of contraction & compare with your own strength or what you judge to be normal.

THERE ARE TWO METHODS TO TEST MUSCLE POWER

1. **ISOMETRIC TESTING (i.e MUSCLE LENGTH CONSTANT)**

The pt is asked to contract the muscle powerfully & to maintain the contracted position while the examiner tries to keep it in original position. In isometric testing, there is no shortening of muscle.

2. **ISOTONING TESTING (i.e MUSCLE TONE CONSTANT)**

The pt is asked to contract the muscle & the examiner opposes the movement at the initial part of contraction. Isometric method is more sensitive & detects minor degree of weakness though isotoning testing is commonly practiced method in neurology.

a.POWER IN UPPER LIMBS

Ask the pt to move the limb side to side on the bed, raise the limb & raise the limb against examiner's resistance. Test the following joints against resistance.

1.SHOULDER-Adduction, Flexion & extension
2.ELBOW-Flexion & extension

b.POWER IN LOWER LIMBS

Ask the pt to move the limb side to side on the bed, raise the limb & raise the limb against examiner's resistance. Test the following joints against resistance.

1.HIP-Flexion,extension,adduction & abduction

2.KNEE-Flexion & extension

3.ANKLE-Plantar flexion & dorsiflexion

To test the power of the back of the thigh muscle, ask the pt to lie in prone position. Now, give resistance as the pt flexes his knee one after the other.

c.TRUNK

Weakness of the muscles of the abdomen is shown by the pt's inability to raise himself in bed without the aid of his arms.

BABINSKI'S RISING UP SIGN

Ask the pt to lie on his back with legs extended & rise up without using his hands. In organic spastic paralysis of the lower limb, the affected limb will rise first owing to the rigidity, but in functional paralysis, this does not occur.

BEEVOR'S SIGN

Pt lies in supine position. Ask the pt to raise his head from the bed while the examiner observes the movement of the umbilicus. In paralysis of the lower part of the rectus abdominis (i.e paraplegia with loss of sensation & sensory level below the umbilicus), umbilicus moves upwards & becomes slit like (vertical slit). For better elicitation of the sign, apply resistance over the pt's forehead with your palm when the pt is raising his head from the bed. In otherwords, when Beevor's sign is positive, there is upper abdominal muscle contraction & retained upper abdominal reflexes, whereas there is absence of lower abdominal muscle contraction & reflexes. The lesion is at the **T10 (T9-T10)** segment.

>To test for the erector spinae muscles of the back, ask the pt to lie down in prone position & try to raise his head from the bed by extending the neck & back. If the back muscles are healthy, they will be seen to stand out prominently during this effort.

HOOVER'S CONTRALATERAL LEG SIGN

It is a test to diagnose hysterical hemiplegia. In this test, when the pt attempts to raise the paralysed leg, the opposite heel does not make counter pressure backwards on the palm of the examiner's hand placed below the opposite heel as in the organic hemiplegia.

BABINSKI'S LEG FLEXION TEST

If a pt of organic hemiplegia is asked to sit up from supine position against examiner's resitance, then the paralysed leg flexes involuntarily while in hysteria the normal leg is flexed first.

>Power of the muscle-Unilateral weakness of the upper limb extensors & lower limb flexors (PYRAMIDAL WEAKNESS) suggest a lesion of the pyramidal tract while bilateral proximal weakness suggest myopathy & bilateral distal weakness suggest peripheral neuropathy.

TESTING THE MUSCLES OF THE UPPER LIMB

1.ABDUCTOR POLLICIS BREVIS

Ask the pt to abduct the thumb in a plane at right angles to the palmar aspect of the index finger against the resistance of your own thumb. The muscle can be felt & seen to contract.

2.OPPONENS POLLICIS

Ask the pt to touch the tip of the little finger with the point of the thumb. Oppose the movement with your thumb or index finger.

3.FIRST DORSAL INTEROSSEUS

Ask the pt to abduct the index finger against your resistance.

4.INTEROSSEI & LUMBRICALS

Test the pt's ability to flex the metacarpophalangeal joints & to extend the distal interphalangeal joints. The interossei also adduct & abduct the fingers.

5.FLEXORS OF THE FINGERS

Ask the pt to squeeze your fingers. Allow the pt to squeeze only your index & middle fingers-this is sufficient to assess strength of grip without having your fingers painfully crushed.

6.EXTENSORS OF THE WRIST

Ask the pt to make a fist which will result in firm contraction of both flexors & extesors of the wrist. Then you try forcibly to flex the wrist against the pt's resistance to maintain the posture. It should be almost impossible to overcome the wrist extensors of a healthy person. Slight weakness of the wrist extensors may be elicited by asking the pt tograsp something firmly in his hand. If the wrist extensors are weak, then the wrist becomes flexed as he does so, because the wrist flexors are then stronger than wrist exensors.

7.FLEXORS OF THE WRIST

Ask the pt to squeeze your fingers. Allow the pt to make a fist & try to overcome wrist flexion.

8.BRACHIORADIALIS

Place the arm midway between prone & supine position. Then ask the pt to bend uo the forearm whike you oppose the movement by grsdpong the hand. The muscle, if healthy, will stand iut promoinently at its upper part.

9.BICEPS

Ask the pt to bend up the forearm against resistance with the forearm in full supination. The muscle will stand out clearly.

10.TRICEPS

Ask the pt to straighten out his flexed forearm against your resistance.

11.SUPRASPONATUS

Ask the pt to lift the arm straight out at right angles to the side. The first 30 degree of this movement is carried out by the supraspinatus. The remaining 60 degrees is produced by the deltoid.

12.DELTOID

The anterior & posterior fibres of the deltoid help to draw the abducted arm forwards & backwards respectively. The middle fibres abduct the shoulder as mentioned above under supraspinatus.

13.INFRASPINATUS

Ask the pt to tuck the elbow into the side with the forearm flexed to a right angle. Then ask the pt to rotate the limb outwards against your resistance, the elboe being held against the side throughout. The muscles can be seen & felt to contract.

14.PECTORALS

Ask the pt to stretch the arms out in front & then to clasp the hands together while you andeavour to hold them apart.

15.SERRATUS ANTERIOR

When this muscle is paralysed, the scapula is winged with the vertebral border projecting posteriorly. The pt is unable to elevate the arm above the right angle, the deformity becoming more apparent as they try to do so. Pushing forwards with the hands against the resistance, such as a wall, also brings out the deformity.

16.LATISSIMUS DORSI

Ask the pt to clasp hands behind their back while you, standing behind the pt, offer passive resistance to the downward & backward movement. Alternatively, the two posterior axillary folds can be felt as the pt coughs.

17.TRAPEZIUS

The upper part of the trapezius is tested by asking the pt to shrug their shoulders while you try to press them dodn from behind. The muscle's lower part can be tested by asking the pt to approximate the shoulder blades.

TESTING THE MUSCLES OF THE TRUNK

1.BEEVOR'S SIGN & ABDOMINAL WEAKNESS

2.DIAPHRAGM

3.SPINAL EXTENSORS

TESTING THE MUSCLES OF THE LOWER LIMB

1.INTRINSIC MUSCLES OF THE FOOT

2.DORSIFLEXION & PLANTAR FLEXION OF FEET & TOES

3.EXTENSORS OF THE KNEE

4.FLEXORS OF THE KNEE

Raise pt's lower limb from the bed, supporting the thigh with your left hand & holding the ankle with your right hand. Then ask the pt to bend the knee against your resistance. You should not be able to overcome this muscle.

5.EXTENSORS OF THE HIP

With the pt's knee extended, lift his or her foot off the bed. Then ask the pt to push it down against your resistance. This is normally a very strong movement & should be impossible to overcome. As for the other leg extensors, a better functional test is to obsrve the pt standing from a low chair & hopping.

6.FLEXORS OF THE HIP

With the pt's lower limb extened on the bed, ask him or her to raise the lower limb off the bed against resistance. Alternatively, the related movement of flexion of the thigh, with the already flexed to a right angle , can be tested.

7.ADDUCTORS OF THE THIGH

Abduct the pt's lower limb & then ask the pt to bring it back to the midline against resistance.

8.ABDUCTORS OF THE THIGH

Place the pt's lower limb together & ask him or her to separate them against resistance.

9.ROTATORS OF THE THIGH

With the pt's lower limb extened on the bed, ask him or her to roll it outwards or inwards against resistance.

MYOTOMES

ARM	
Shoulder abduction	**C5**
Elbow flexion	**C5 &C6**
Elbow extension	**C7 & C8**
Finger flexion	**C8**
Small muscles of hand	**T1**
LEG	
Hip flexion	**L2 & L3**
Hip extension	**L5 & S1**
Knee flexion	**L5 & S1**
Knee extension	**L3 & L4**
Ankle inversion	**L4**
Ankle eversion	**L5 & S1**
Plantar flexion	**S1 & S2**
Dorsiflexion of foot & toes	**L4 & L5**

MUSCLE POWER GRADING

It is obtained only when the pt is conscious since it requires pt's co-operation.

GRADE	CHARACTERISTICS
0	No visible muscle contraction i.e complete paralysis
1	Visible or palpable flicker of contraction but no movement of joint or limb
2	Movements possible only after elimination of gravity i.e side to side movement of limb
3	Movement sufficient to overcome the gravity but not against additional (examiner's) resistance
4	Movement sufficient to overcome the gravity & also some additional (examiner's) resistance but weaker than normal
5	Normal power i.e movement sufficient to overcome gravity & powerful resistance

ALTERNATIVE METHOD FOR MUSCLE POWER GRADING

Grossly, ask the pt to lift his leg. If he can do so very very slowly with great difficulty, then the power is grade 3. If he can lift immediately without any difficulty, then the power it is grade 4.

4.REFLEXES

To be tested in upper limb, lower limb & trunk in both sides.

A.SUPERFICIAL REFLEXES (=CUTANEOUS REFLEXES)

First test the reflexes in the normal side & then see in the abnormal side & compare.

1.PLANTAR REFLEX (L5 & S1) [PRIMARILY L5] (=BABINSKI'S REFLEX)

-Present (Elicited)/ Not Elicited or grossly depressed

a.CLASSICAL PLANTAR REFLEX

>Pt lies supine with extended legs. Ask him to relax the muscles of lower limb. Now the lower limb is partially flexed & externally rotated. Place your lt palm over the ankle joint with fingers not touching the Achilles tendon & slight pressure is applied to fix the ankle joint. Now with the rt hand lateral border of the foot is scratched gently with a key or pointed end of a knee hammer starting from the heel & then going along the lateral border of sole towards the little toe & then turn medially across the metatarsus upto the head of the second metatarsus in a hocky stick fashion. **NEVER TOUCH THE BALL OF THE GREAT TOE & FLEXOR CREASES OF THE TOES**. Stop stimulating the sole as soon as the first movements of the great toe occurs. Now do the test on the other side. This is the **PLANTAR B METHOD**.
>In a **PLANTAR A METHOD**, stimulus is not taken medi-ally across the metatarsus i.e only the lateral border of the sole of the foot is stimulated.
>First stimulation taking 1-2 second & slow stimulation taking 5-6 second can be applied. Planter B method with the slow stimulation is the best method. The duration of the stimulation is more important than intensity.

DIFFERENT PLANTAR RESPONSES

1.FLEXOR PLANTAR RESPONSE

In healthy adults, even a slight stumulus produces contraction of the tensor fascia lata, often accompanied by a slighter contraction of the adductors of the thigh & of the sartorius. With a slightly stronger stimulus, flexion of the four outer toes appears which increases with the strength of the stimulus until all the toes are flexed on the metatarsus & drawn together with the ankle being dorsiflexed & flexion of the knee & hip. With still stronger stimulus, withdrwal of the limb occurs. The normal plantar response is flexor type. The plantar reflex is never completely absent in healthy subject.

2.MINIMAL PLANTAR RESPONSE

On eliciting the plantar reflex, no movement of the toes is seen. The presense of positive plantar response is assessed by feeling for the contraction of adductors of the thigh, sartorius & tensor fascia lata.

2.EXTENSOR PLANTAR RESPONSE

The responses are-Dorsiflexion (extension) of the great toe (movement occurs at metatarsophalangeal joint) preceeds all other movement. It is then followed by spreading out (Fanning) & extension of the other 4 toes, dorsiflexion of the ankle, flexion of the hip & knee & contraction of tensor fascia lata. It is found in pt with corticospinal tract lesion & is thus a **PATHOGNOMONIC FEATURE OF UMN** lesion (Plantar reflex is a local reflex arc modified by the pyramidal tract). In otherwords, extensor plantar response is found in UMN lesion above the S1 level of the spinal cord. An extensor plantar response is often found, during sleep deep coma & in a child below 1 year. Extensor plantar response is often associated with hyperreflexia, hypertonicity & clonus. **THE FIRST MOVEMENT OF THE GREAT TOE IS IMPORTANT.** Extension of great toe after a brief initial flexion is not an extensor response.There is nothing called negative Babinski's sign. Pseudo-Babinski's sign may be seen in plantar hyperaesthesia or chorea.

>The Babinski's sign can be elicited only by stroking the lateral aspect of the dorsum of the foot in the presence of the minimal pyramidal tract lesion & in individuals with thick soles.
>The Babinski's sign can be elicited by stroking the medial aspect of the foot when the lesion becomes dense (due to increase in the reflexogenic area).
>If no plantar reflex is elicited with the pt's knee flexed & thigh externally rotated, it can be elicited by extending the pt's knee, or even applying pressure on the knee (the thigh being in the neutral position).
>With repeated stimulation of the sole of the foot, the plantar reflex may become fatigued & the extensor plantar reflex may not be elicitable.

3.EQUIVOCAL RESPONSE

This is an incomplete response where the full components of the extensor plantar response is not manifested e.g

1. Only fanning out & extension of 4 toes is seen without any movement of the great toe. Or
2. The hemiplegic side does not show any response & the healthy side shows flexor response (sometimes seen in early cases of CVA i.e during shock stage) Or
3. Asymmetry of flexor response in both sides. Today's equivocal response may be tomorrow's extensor response. Or

4. There may be flexion of the knee & hip with no movement of the toes. Or
5. Only extension of great toe or extension of great toe with flexion of the smaal toes. Or
6. There is rapid but brief extension of toes at first, which is followed by flexion or predominant flexion followed by extension. Extension→Flexion→Extension.

4.NO RESPONSE

After scratching the sole of the foot, there is no movement of the any of the toes.

5.WITHDRAWAL RESPONSE

This response is often seen in normal persons with hyperaesthetic or sensitive sole. It is seen that initial normal flexor response is quickly followed by mass extension of toes with withdrawal of the entire leg.

6.FLEXOR SPASMS

It consists of an exaggerated extensor plantar response, the whole limb being suddenly drawn up into flexion & the great toe is extended. It is common in spinal cord disease & in some pt's with bilateral UMN lesion at a higher level & in presence of posterior column disease-Multiple sclerosis, subacute combined degeneration.

7.EXTENSOR SPASM

It is found in corticospinal lesion when posterior column function is normal.

8.PSEUDO BABINSKI'S SIGN

>False Babinski's sign occurs in the absence of pyramidal tract lesion. Here, there is no associated contraction of the hamstring muscles & applying pressure on the base of the great toe while eliciting the plantar response inhibits the withdrawal extensor response.

PEUDO BABINSKI'S SIGN IS FOUND IN

1. A voluntary withdrawal in overtly sensitive individuals on attempting to stroke the sole of the foot.
2. As a response in plantar hyperaesthesia
3. Application of a strong or painful stimulus to the sole of the foot.
4. In athetosis or chorea, where a big toe may extend as a response to dystonic posturing.
5. If the short flexors of the toes are paralysed (due to LMN lesion), then there may be an inversion of the plantar reflex.

BABINSKI'S SIGN IN ABSENCE OF PYRAMIDAL TRACT LESION

1. Infancy (Upto 1 year of age)
2. Deep sleep
3. Deepp anesthesia
4. Narcotic overdose
5. Alcohol intoxication
6. Following electroconvulsive therapy (ECT)
7. Coma secondary to metabolic disturbance
8. Post-traumatic state
9. In **CHEYNE-STOKES RESPIRATION**, the extensor response may appear during the period of apnea, whereas in the phase of active respiration, the normal reflex is seen.

PLANTAR EQUIVALENCE

The undermentioned signs show a positive Babinski response when the reflexogenic area spreads up in the lower limb & are useful in eliciting Babinski response when the pts are unco-operative or in pts whose soles are extremely sensitive.

A.OPPENHEIM SIGN

-Present/ Absent

Stand on the rt side of the pt. Now apply heavy pressure by placing the lt thumb & lt index finger on either side of the shin of the tibia (below the tibial tuberosity) from above downwards. Greater pressure is applied on the medial side. The extensor response usually occurs towards the end of the stimulation.

B.GORDON'S SQUEEZE (OR SIGN)

-Present/ Absent

Squeezing the calf muscle with the rt thumb & rt index finger causes extension of the great toe with some dorsiflexion of the foot.

C.SCHAFFER'S SQUEEZE (OR SIGN)

-Present/ Absent

Squeezing the Achilles tendon with the rt thumb & rt index finger produces extensor plantar response.

D.CHADDOCK'S STROKE (OR SIGN)

-Present/ Absent

Scratching the skin of the lateral side of the dorsum of the foot from below the lateral malleolus towards little toe by the pointed end of the knee hammer produces extensor plantar response.

>Chaddock's stroke is usually done in cases in which extensor plantar reflex can not be elicited by classical method (i.e plantar B method) which usually happens in persons thick soles (village persons not using slipper).

E.GONDA PRESSDOWN (OR SIGN)

-Present/ Absent

Plantar flexion of the little toe produces extensor plantar response.

F.BING SIGN

-Present/ Absent

Pricking the dorsum of the foot by a pin produces extensor response.

G.MONIZ SIGN

-Present/ Absent

Extensor response is seen after forceful passive plantar flexion of the ankle.

H.BRISSAUD'S REFLEX

-Present/ Absent

Contraction of tensor fascia lata as a part of extensor response. This reflex is helpful in pts with amputated or absent great toe.

>Oppenheim sign, gordon's squeeze, schaffer's squeeze, chaddock's stroke, gonda pressdown plantar equivalence methods are commonly practiced in clinical medicine. These methods are useful in non-cooperative pts or when the soles are extremely sensitive or the soles are wounded or injured.

>**IN GENERAL, PLANTAR STIMULATION IS MORE EFFEC-TIVE THAN NONPLANTAR STIMULATION.**

1. The afferent nerve of plantar reflex is tibial nerve. The efferent nerve is tibial nerve for flexor response & peroneal nerve for extensor response.
2. When not elicited, plantar response can be reinforced by rotating the pt's head to opposite side or applying warmth to the cold skin of the sole.

ROSSOLIMO'S SIGN

- **METHOD**

  Either tap the ball of the foot by percussing the plantar surface of the ball of the great toe with hammer or flick the distal phalanges of the toes into extension & then allow them to fall back into their normal position.

- **RESPONSE**

  Pyramidal tract lesion manifests by plantar flexion of all the 5 toes. It is the only sign with UMN lesion which manifests by plantiflexion of great toe. It is the homologue of Hoffman's sign of upper limb.

2.SUPERFICIAL ABDOMINAL REFLEX (T7-T12 :-T7 to T9-Above the umbilicus & T10 to T12-Below the umbilicus)

1.UPPER

-Absent/ Present-Bilaterally/ Unilaterally-Lt/ Rt

2.MIDDLE

-Absent/ Present-Bilaterally/ Unilaterally-Lt/ Rt

3.LOWER

-Absent/ Present-Bilaterally/ Unilaterally-Lt/ Rt

Pt lies supine & relaxed with abdomen exposed. Stroke is given swiftly but lightly & bilaterally from **OUTSIDE TO THE MIDLINE** by the pointed end of knee hammer (or a key) at 3 places-**1**.Below & parallel to the costal margin, **2**.At the level of umbilicus & **3**.Above & parallel to the inguinal ligament. Observe for the contraction of the muscles & deviation of the umbilicus towards the stimulus (occurs in normal person). The stroking agent is held at an acute angle with the abdominal skin & it should not cause any abrasion on the skin. It is often impossible to elicit this reflex in anxious patients, eldrly obese & multiparous women.

>**IN HEMIPLEGIA, THE ABDOMINAL REFLEX IS LOST IN PARALYSED SIDE ONLY.** In UMN lesion, superficial abdominal reflex is absent. This reflex is most useful when there is preservation of the upper (spinal cord level T9) but not lower (T12) abdominal reflexes, indicating a spinal lesion between T9 and T12, or when the response is asymmetric.

3.CREMASTERIC REFLEX (L1 & L2)

- Present (Elicited)/ Absent (Not Elicited)

>Pt is in supine position. The thigh is abducted & externally rotated. Lightly scratch the medial aspect of the upper part the thigh from **ABOVE DOWNWARDS (NOT BELOW UPWARDS)** with the pointed end of the knee hammer. Observe for upward movement of the ipsilateral testicles (due to reflex contraction of cremasteric muscles). Alternatively, this reflex can be easily elicited by pressing over the sartorius in the lower part of the Hunter's canal. Often it is very difficult to elicit this reflex in the elderly. This reflex is lost in UMN lesion i.e damage to L1 & L2 spinal segments, hydrocele & hernia. Cremasteric muscle contraction causes elevation & retraction of testis.

>**Afferent-Ilioinguinal nerve (a branch of Femoral nerve), Efferent-Genital branch of Genitofemoral nerve**

4.ANAL REFLEX (S2,S3 & S4)

-Present/ Absent

Contraction of the anal sphincter when the perianal skin is scratched. It is particularly important to test for these cutaneous reflexes in any patient with suspected injury to the spinal cord or lumbosacral roots.

5.SCAPULAR REFLEX (C5 & T1)

-Present/ Absent

Stroking the skin in the interscapular region causes contraction of the scapular muscles.

6.BULBOCAVERNOSUS REFLEX (S3 & S4)

-Present/ Absent

Pinching the dorsum of the glans penis causes contraction of the bulbocavernosus.

7.CORNEAL REFLEX (=LID REFLEX)

Already mentioned.

- **IF SUPERFICIAL REFLEXES ARE NOT ELICITED, REINFORCEMENT TO ELICIT THESE REFLEXES CAN BE ACHIEVED BY TALKING WITH THE PATIENT TO DIVERT HIS ATTENTION.**

B.DEEP TENDON REFLEXES (DTR) (=MUSCLE STRETCH REFLEXES)

PRE-REQUISITES

Stand on the rt side of the pt (even for the elicitation of jerk on the lt side). Ask the pt to relax & lie down

(supine position). **EXPOSE THE MUSCLE FULLY.** Tap the tendon & not the muscle belly. Observe both contraction of the muscle & the movement of the limb. **ALWAYS COMPARE WITH THE OTHER SIDE.** The knee hammer should be held with 2 finger i.e rt thumb & rt index finger. Use the hammer by swinging movement at the wrist joint (i.e the hammer should have a free fall). Sudden & single blow is applied over the tendon. All the deep tendon reflexes of both the sides are tested by standing on the rt side.
>Deep tendon reflexes are also known as jerks. That means Biceps Reflex=Biceps Jerk.

DIFFERENTIATION BETWEEN EXAGGERATED & BRISK RESPONSE

Roughly exaggerated reflex means, the amplitude of the limb movement is more & brisk reflex means the reflex is very prompt in its response. We may conclude that hyperreflexia is only of pathological significance when it is asymmetrical (comparing with the other side) or if associated with other signs of UMN lesion (spasticity, Babinski's sign clonus etc.)

>**JERKS OF BOTH SIDES SHOULD BE COMPARED BEFORE DERIVING A CONCLUSION.**

GRADING OF TENDON REFLEXES

RESPONSE	GRADE
ABSENT	0
PRESENT (AS A NORMAL ANKLE JERK)	1
BRISK (AS A NORMAL KNEE JERK)	2
VERY BRISK	3
PRESENCE OF CLONUS	4

INTERPRETATION OF TENDON REFLEXES

1. Present-In health
2. Lost or diminished-LMN lesion, UMN lesion in shock stage
3. Exaggerated-Anxiety neurosis, nervousness, hysteria, thyrotoxicosis, tetany & tetanus
4. Brisk-UMN lesion
5. Pendular-Cerebellar lesion & chorea

UPPER LIMB DTRs

1.BICEPS JERK (C5 & C6)

- Present (Elicited)/ Lost (Not Elicited)/ Diminished OR Grossly depressed/ Exaggerated/ Brisk

>Uncover the entire upper limb. The elbow is semiflexed at rt angle & the forearm is placed in a semipronated position. The limb may rest upon your lt hand or on pt's abdomen. Place your lt thumb or index finger firmly on the biceps tendon & tap suddenly over your finger by the pointed end of the knee hammer (so that the blow is aimed directly through your thumb at the bicep tendon). Observe for flexion at the elbow & watch for & feel the contraction of the biceps muscle.
>Test the lt side Bicep's jerk by standing on the rt side. For this, pt lies in supine. Keep the lt upper arm on the bed & flex the lt forearm to 90 degree. Rest the flexed lt forearm on the side of the abdomen on the lt side. Place your lt thumb or index finger firmly on the biceps tendon & tap suddenly over your finger by the pointed end of the knee hammer. Observe for flexion at the elbow & watch for & feel the contraction of the biceps muscle.
>Lesion at C5-C6 abolishes Biceps jerk.

2.TRICEPS JERK (C6 & C7)

-Present (Elicited)/ Lost (Not Elicited)/ Diminished OR Grossly depressed/ Exaggerated/ Brisk

Uncover the entire upper limb. Flex the elbow to right angle with palm towards the body & pull it slightly across the chest. Support the hand at the wrist by your lt hand so that the upper limb does not fall on the bed. Suddenly tap the triceps tendon just above the olecranon. Watch for the contraction of the triceps & extension at the elbow. Care must be taken to strike the triceps tendon & not the muscle belly itself. All muscles show a certain amount of irritability to direct mechanical stimuli, but this is a direct response, not a stretch reflex.

3.SUPINATOR=BRACHIORADIALIS JERK(C5 & C6)

- Present (Elicited)/ Lost (Not Elicited)/ Diminished OR Grossly depressed/ Exaggerated/ Brisk

Elbow is slightly flexed & forearm is semipronated. Forearm rests on the abdomen or in the lap with the palm down. Sharply tap on the styloid process of the radius with the broad end of the knee hammer. Observe flexion at the elbow & supination of forearm.

4.INVERSE SUPINATOR JERK (C5& C6) (=INVERSION OF SUPINATOR JERK)

-Present (Elicited)-Bilaterally/Unilaterally-Rt/ Lt
-Absent (Not Elicited)-Bilaterally/Unilaterally-Rt/ Lt

When there is a lesion in the spinal cord at C5-C6 segment, there is hyperexcitability of anterior horn cells below this level. So,during elicitation of supinator jerk, there is no flexion at the elbow joint but only brief flexion of fingers (as C7-C8 take upperhand) occur. Similarly,in inversion of biceps jerk, (lesion at C5-C6 segment), there is no contraction of the biceps during the elicitation of biceps jerk, but one can see the contraction of the triceps(as C6-C7 take upperhand). Inversion of a jerk localizes the level of the level of the lesion in the spinal cord. Usually inversion of the supinator & biceps jerks are seen together.

5.FINGER JERK (C7,C8 & T1) (=FLEXOR FINGER JERK)

-Present (Elicited)-Bilaterally/ Unilaterally-Rt/ Lt
-Absent (Not Elicited)-Bilaterally/ Unilaterally-Rt/ Lt

Place the tips of the examiner's middle & index fingers across the palmar surface of the proximal phalanges of the pt's relaxed fingers. Then tap the examiner's finger lightly with a knee hammer. The normal response is slight flexion of the pt's fingers. This becomes exaggerated if there is hyperreflexia. Hyperreflexia means exaggerated response.

6.HOFFMAN'S REFLEX (C7,C8 & T1)

-Present (Elicited)-Bilaterally/Unilaterally-Rt/ Lt
-Absent (Not Elicited)-Bilaterally/Unilaterally-Rt/ Lt

Pt's hand is pronated & the examiner grasps the middle phalanx of the pt's middle finger with his index finger & thumb of lt hand. Place the examiner's rt index finger under the distal interphalangeal joint of the pt's middle finger. Then briskly flick down the pt's middle finger tip with the examiner's rt thumbtip & allow the pt's distal phalanx to spring back to the normal position while observing pt's thumb for any movement. A positive response consists of brisk flexion & adduction of pt's thumb (flexion of other fingertips) which indicates UMN lesion in the upper limb. This reflex may not be present in all pts with pyramidal tract lesion & it may be present in a nervous individual without any organic lesion. If the reflex is present on one side (unilateral only), it may have some value as a sign of pyramidal tract lesion.

>You can also demonstrate Hoffman's Reflex by holding the distal part of the middle phalanx of the pt's middle finger with your index & middle finger in a cigarette holding fashion. Then gently flick down terminal phalanx of the pt's middle finger with your rt thumb & look for the flexion & adduction of the pt's thumb.

7.WARTENBERG'S SIGN

-Present (Elicited)-Bilaterally/Unilaterally-Rt/ Lt
-Absent (Not Elicited)-Bilaterally/Unilaterally-Rt/ Lt

The pt supinates his hand, slightly flexing the fingers, with the thumb in abduction. The examiner pronates his hand & hooks his flexed fingers with that of the pt's fingers. Both then flex their fingers & pull against each other as forcibly as possible. Normally, the thumb extends thouigh the terminal phalanx may flex slightly. In the presence of UMN lesion (Hypertonia), the thumb adducts & flexes strongly. Wartenberg's sign indicates pyramidal tract lesion & may be taken as an equivalent of Babinski sign in case of amputation of both lower limbs.

LOWER LIMB DTRs

1.KNEE JERK (L2,L3 & L4)
(=PATELLAR REFLEX=QUADRICEPS REFLEX)

- Present (Elicited)/ Lost(Not Elicited)/ Diminished OR Grossly depressed/ Exaggerated/ Brisk

METHODS TO DEMONSTRATE KNEE JERK

A.CONVENTIONAL METHOD

>Pt lies in supine position. Now flex pt's both the knee joint by placing your lt hand & forearm in the popliteal fossa of both the knee joint to make an obtuse angle (i.e more than 90 degree). Uncover both the thighs. The patellar tendon is struck sharply midway between its origin & insertion with the pointed end of the knee hammer. Observe for the contraction of the quadriceps & brief extension of knee. Observe for the symmetry of the reflex by comparing the amplitude of the movement on one side with the other side. Normal knee jerk is brisk in response.
>In those pts in whom the reflexes are difficult to elicit or appear to be absent, apply the technique of reinforcement. For reinforcement to elicit deep tendon reflexes of lower limb, Jendrassik's maneuver is used.

JENDRASSIK'S MANEUVER (REINFORCEMENT)

Ask the pt to hook the fingers of the two hands together & then to pull them against one another as hard as possible immediately before striking the tendon (Patellar & Achiles) & to relax immediately thereafter. **ALWAYS PERFORM JENDRASSIK'S MANEUVER BEFORE DECLA-RING A TENDON REFLEX ABSENT.**

>When reinforcing the upper limb reflexes, ask the pt to clench the teeth or squeeze the knees (push the knees hard together) immediately before striking the tendon & to relax immediately thereafter.
>It is very important to remember that the phenomenon of reinforcement lasts for less than a second. So the pt is asked to do the maneuver almost synchronously with the tapping of the tendon.
>Reinforcement (to make some strong voluntary muscular effort) acts by increasing the excitability of anterior horn cells & increasing the recruitment of gamma fibres i.e by increasing the sensitivity of the muscle spindle primary sensory endings to stretch (increased gamma fusimotor drive).

B.SPECIAL MTHOD

Pt sits on a chair (or bed) with legs hanging free side by side. After tapping the patellar tendon, look for the pendulous movement of the legs. This pendular movement is classically seen in cerebellar lesion.

>Lesion at L2-L4 abolishes Knee jerk.

2.ANKLE JERK (S1 & S2) [PRIMARILY S1]
(=TENDOACHILLES REFLEX)

- Present (Elicited)/ Lost (Not Elicited)/ Diminished OR Grossly depressed/ Exaggerated/ Brisk

A.CONVENTIONAL METHOD

Lower limb flexed at the knee & foot is slightly everted i.e foot is externally everted. (The foot may rest on the opposite limb). **EXPOSE THE CALF MUSCLES FULLY.** Now slightly dorsiflex the foot with the lt hand so as to stretch the Achilles tendon & with the rt hand strike the tendon on its posterior surface with the wider side of the knee hammer. A quick contraction of calf muscle resulting in plantar flexion at the ankle occurs.

B.SPECIAL MTHOD

Pt is in kneel down position on a chair with both feet hanging out of the chair. A sharp tap is applied on Achilles tendon (do not passively dorsiflex the foot). Calf muscles contract & plantiflexion of the foot occurs. It is done specially in myxedema cases to observe the delayed relaxation time.

>Lesion at S1 abolishes Ankle jerk.

>**IN THE INITIAL PERIOD OF HEMIPLEGIA AND PARAPLEGIA (UMN LESION), THERE IS AN ACUTE NEURONAL SHOCK STAGE DURING WHICH PLANTAR AND OTHER REFLEXES ARE NOT ELICITED AND THERE IS HYPOTONIA INSTEAD OF SPASTICITY.**

C.CLONUS

>Clonus is the rhythmical contraction of a muscle in response to sudden, passive & sustained stretching of the muscle. Clonus is always associated with brisk tendon reflex, spasticity & Babinski's sign. It is a very reliable sign of pyramidal tract lesion.

>**WHEN THERE IS MORE THAN 6 OSCILLATIONS ARE SEEN,IT IS CALLED SUSTAINED CLONUS(=TRUE CLONUS) & WHEN LESS THAN 6 OSCILLATIONS ARE SEEN,IT IS CALLED UNSUSTAINED CLONUS (=PSEUDO CLONUS).**

1.PATELLAR CLONUS (=KNEE CLONUS)

-Sustained/ Unsustained

Pt lies supine & relaxed with knee extended. Patella is then pulled upwards with a fold of skin behind the palm with the examiner's thumb & index finger of lt hand. Now sharply push the patella towards the foot with the thumb & index finger (so as to stretch the tendon). Following the initial jerk, exert sustained pressure with the thumb & index finger in a downward direction on the patella. If the patellar clonus is present, a series of quadriceps contractions & relaxations producing oscillations of the patella is seen. Patallar clonus is present in case of UMN lesion over **L2,L3 & L4** spinal segments.

2.ANKLE CLONUS

-Sustained/ Unsustained

Pt lies in supine position. Support the flexed knee(120 degree) with your lt palm in the popliteal fossa so that the ankle rests gently on the bed. Using the other hand, suddenly & briskly dorsiflex the foot by pressing the upper part of the sole with the right palm (Palmar aspect of four fingers except thumb) & raise the foot off the bed so that **HEEL DOES NOT TOUCH THE BED**. Following the initial jerk, sustain the steady pressure & observe for to-and-fro movement of the foot & a series of contractions and relaxations of calf muscles when ankle clonus is present. Ankle clonus is produced in UMN lesion above the level of **S1 & S2** spinal segments.

3.JAW CLONUS

Elicit the jaw jerk & observe for series of closure & opening of the mouth.

3.WRIST CLONUS

Elicited by sudden passive extension of the fingers.

>Jaw clonus & wrist clonus is not routinely practiced in clinical neurology.
>Never forget to examine a pt for clonus if there is presence of brisk tendon reflex.
>Patellar clonus or ankle clonus if present are surest sign of UMN lesion.

5.CO-ORDINATION (OF MOVEMENT)

-Intact/ Could not be tested because of spasticity or rigidity (i.e, in case of hypertonia)

A.CEREBELLAR CO-ORDINATION

I.IN UPPER LIMB-

a.FINGER-NOSE TEST

-Normal/ Abnormal

Ask the pt to touch his nosetip with the tip of his own index finger & then examiner's rt index finger held in front of the pt's face first with the eyes open & then eyes closed. To make the test more discerning, move the target finger tip from one position to another, backwards & forwards as well as side to side & ask the pt to touch the fingertip & then his nose with his eyes open.

>To test for the ataxia due to proprioceptive deficit i.e impairment of position sense in the limb (sensory ataxia), now ask the Pt. to bring the outstretched fingertip to touch the nosetip with **eyes closed**.

b.DYSDIADOCHOKINESIA/ RAPID ALTERNATING MOVEMENT

-Present/ Absent

>Flex elbow to right angles & then alternately pronate & supinate as rapidly as possible.
>Place one palm upwards & then hit the upfacing palm with the palmar & dorsal aspects of the fingertips of the other hand alternatively as rapidly as possible.

c.IMPAIRED CHECK SIGN/ REBOUND SIGN

-Present/ Absent

Pt flexes the elbow against resistance which is suddenly released. Observe for the oscillation of forearm.

d.DESCRIBE A CIRCLE IN AIR WITH FINGER

-Can/ Can't

Ask the pt to describe a circle in the air with his index finger.
(Others-Threading a needle. Watch the pt while dressing or undressing, picking up pins from the table, combing etc.)

II.IN LOWER LIMB-

a.HEEL-SHIN/ HEEL-KNEE TEST

-Normal/ Impaired

Pt lies supine with eyes open. Ask the pt to lift one leg straight up in air, then bend the knee & place the heel of the raised leg on the opposite leg below the tibial tuberosity & then slide the heel down the surface of the tibial shaft towards the ankle. After reaching the ankle, ask the pt to keep his leg on the bed. Repeat several times in quick succession. Each time pt reaches the ankle, ask him to keep his leg on the bed & then restart. Now ask the pt to do the test on the other side. Observe errors in the direction & speed of movement. Before doing the test, demonstrate it clearly to the pt.
>To render the test more complex, ask the pt first to raise the leg & to touch the examiner's finger with the big toe before placing the heel on knee.

b.WALKING

1. Along a straight line-Can walk/ Deviation

2. **TANDEM WALK(=HEEL-TOE TEST)**

Ask the pt to walk along a line placing the heel of one foot immediately adjacent to the toe of the one behind.

c.DESCRIBE A CIRCLE IN AIR WITH THE TOE

- Can/ Can't

B.SENSORY CO-ORDINATION

a.ROMBERG'S SIGN (DORSAL COLUMN)

- Positive/ Negative

>Ask the pt to stand with his bare feet placed close to eachother with eyes open initially. If he can do this, he is then asked to close his eyes with his feet close together. Romberg's sign is said to be present or positive when the pt begins to sway or about to fall as soon as he closes his eyes. The cardinal feature of this sign is that the pt is more unsteady while standing with his eyes closed than when the eyes are kept open. It is important to remember that **ROMBERG'S SIGN IS A SIGN OF SENSORY ATAXIA & IS NOT A TEST FOR CEREBELLAR FUNCTION**. A pt with cerebellar ataxia or labyrinthine lesion sways (or shows little increase in instability) at the beginning of the test with open eyes. **IN SIMPLE WORDS, IF THE PATIENT SWAYS WITH EYES OPEN, IT IS DUE TO CEREBELLAR ATAXIA & IF THE PATIENT SWAYS AFTER THE EYES ARE CLOSED, IT IS DUE TO SENSORY ATAXIA.** Romberg maneuver is primarily a test of proprioception.

>**If the pt falls with eyes shut, then it indicates loss of joint position sense at the ankles.**
>**Romberg's sign is positive in sensory ataxia & is negative in cerebellar ataxia.**

METHOD TO TEST ROMBERG'S SIGN IN UPPER LIMB

Ask the pt to sit down & extend his both the upper limbs to his front & then close his eyes. In case of cerebellar ataxia, the upper limbs will sway up & down with eyes open. In case of sensory ataxia, the upper limbs will sway up & down with eyes closed. Tell this test only when you are asked, otherwise not.

6.INVOLUNTARY MOVEMENTS

1. Location
2. Quality-Fine/ Coarse
3. Rate-Fast/ Slow with Closed Eyes/ Opened Eyes
4. Aggravating Factors-Activity/ Fatigue/ Emotion

A.TREMOR

-Static/ Kinetic/ Intention/ Flapping
Tremor is the rhythmic oscillatory movements.

a.METHOD TO DEMONSTRATE KINETIC TREMOR (=ACTION TREMOR)

>Ask the pt to extend the arms in front of him & separate the fingers & observe the hands for **COARSE** tremors. If tremor is not seen with extended arms, place a paper on the dorsum of the hands (or over the dorsal aspect of the outstretched fingers) & look tangentially to see **FINE (i.e7-10/second**) tremor. According to Harrison, fine tremor is best elicited by asking the pt to stretch out their fingers and feeling the fingertips with the palm of the examiner.
>Pt is asked to protrude his tongue out of the oral cavity resting over the lower lip for at least 30 seconds & observe for tremor.
>Action tremor is characterized by fine in nature (7-10/ second), disappears at rest & appears in precise & accurate movements, may be seen in tongue, lips & head (other than limbs).

b.METHOD TO DEMONSTRATE INTENTION TREMOR

The pt is asked to hold a glass of water kept on the table or perform finger nose test. Observe the movement which becomes clumsy before he holds the glass of water or touches his nose. This tremor appears at the goal point of an action & is absent at rest & in the beginning of any movement. This tremor is coarse (4-5/second) in nature.

c.METHOD TO DEMONSTRATE FLAPPING TREMOR

Keep the pt's upper limb on bed with forearm fixed. Now the wrist is passively extended by holding the finger for a few seconds & then the pressure is released. Pt is then instructed to keep the hand in extended position & observe for the flapping tremor in the extended hand. It is also called **ASTERIXIS OR BAT'S WING TREMOR**.

ASTERIXIS (=LIVER FLAP= FLAPPING TREMOR)

It is non-rhythmic, asymmetric lapse in voluntary sustained position of the extremities, head & trunk. It is best demonstrated by having the pt extend the arms & then dorsiflex the hands. Because elicitation of asterixis depends on sustained voluntary muscle contraction, it is not found in the comatose pt i.e it is **not found in hepatic coma.**

>First look for static tremor, then for kinetic tremor, then for intention tremor & at last for flapping tremor.

B.CHOREA

Jerky, small-amplitude, purposeless involuntary movements. In the limbs choreas resemble fidgety movements & in the face choreas resemble grimaces. Choreas suggest disease in the caudate nucleus as in Huntington's disease or excessive activity in the striatum due to dopaminergic drugs used to treat Parkinsonism etc.

C.ATHETOSIS

Slower writhing movements of the limbs. Often seen combined with chorea & are then termed choreo-athetoid movements. Site of lesion is at lentiform nucleus (Globous pallidus)

D.HEMIBALLISMUS

Unilateral ballistic movements of the limbs or sudden & often violent flinging movement of a proximal limb usually an arm. Seen in vascular lesions of the subthalamic structures (Subthalamic nucleus).

E.DYSTONIA

Movement disorder in which a limb or the head involuntarily takes up an abnormal posture. May be generalized as in various diseases of the basal ganglia or may be focal or segmental, as in spasmodic torticollis when the head involuntarily turns to one side. Other segmental dystonias may cause abnormal disabling postures of a limb to be taken up during certain specific actions, such as in writer's cramp or numerous other occupational cramps.

F.MYOCLONUS

Brief, isolated, random, non-purposeful jerks of muscle groups in the limbs. Myoclonic jerks occur normally at the onset of sleep (hypnic jerks). Myoclonic jerk is a component of the normal startle response which may be exaggerated in some rare (mostly genetic) disorders. Myoclonus may occur in the disorders of the cerebral cortex, when groups of pyramidal cells fire spontaneously. Such myoclonus occurs in some forms of epilepsy in which the jerks are fragments of the seizure activity. Myoclonus can arise fron subcortical structures or, more rarely, from the diseased segments of the spinal cord.

G.TICS

Repetitive semi-purposeful movements such as blinking, winking, grinning screwing up of the eyes. They are distinguished from the other involuntary movements by the ability of the pt to suppress their occurrence, at least for a short time. Tics may become frequent at certain times in the childhood & then disappear. Gilles de la Tourette syndrome consists of a tendency to multiple tics & odd vocalizations.

H.OTHER MOVEMENTS

Do not tell about involuntary movements in the exam unless asked, but you must know in detail about the various involuntary movements so that you can answer common questions if at all asked.

7.GAIT

-Normal/ Hemiplegic/ Could not be tested

IV.SENSORY FUNCTION

-Tested in upper limb, lower limb & trunk both in the rt & lt side

>**SENSORY FUNCTION IS TESTED ONLY WHEN THE Pt IS FULLY CONSCIOUS SINCE IT REQUIRES Pt'S FULL CO-OPERATION. OTHERWISE TELL "SEN-SORY FUNCTIONS COULD NOT BE TESTED BECA-USE OF THE ALTERED SENSORIUM".**

>**FIVE PRIMARY SENSORY MODALITIES INCLUDE-PAIN, LIGHT TOUCH, TEMPERATURE, VIBRATION & JOINT POSITION SENSE.**

>Begin with testing touch & position sense & pin prick later from abnormal area to normal area.

BASIC PRINCIPLES OF TESTING SENSORY FUNCTIONS

Explain the pt clearly what is going to be tested. Pt's cooperation & alertness are essential and try to gain confidence by proper understanding. First test with the eyes open & then eyes closed. Always compare the sensory function with the opposite side for symmetry. First apply the sensory stimulus to the area of altered sensation & delineate its border by testing from abnormal to normal area. Test the dermatomes sequentially. Comparison of response on one side of the body to the other is essential.

SENSORY TRACTS

1.SPINOTHALAMIC TRACTS-Transmits pain, temperature & crude touch.

1.POSTERIOR COLOUMN-Transmits positon, vibration & fine touch.

SENSORY DERMATOMES

Pt is considered to be standing with the palm of the hands facing forwards

1. **C1**-No cutaneous supply; supplies meninges
2. **C2**-Occiput, **angle of the mandible, over the parotid gland** & Earlobe
3. **C3**-Nape (Back) of the neck
4. **C4**-Above & below clavicle
5. **C5**-Deltoid; outer aspect of the shoulder tip
6. **C6**-Radial half of anterior forearm including palmar aspect of thenar eminence & palmar aspect of thumb
7. **C7**-Middle finger (Palmar aspect)
8. **C8**-Little finger, hypothenar eminence & ulnar aspect of hand
9. **T1**-Ulnar aspect of forearm
10. **T2**-Ulnar aspect of arm
11. **T3**-Axilla
12. **T4**-Nipple
13. **T6**-Xiphisternum
14. **T8**-Rib margin
15. **T10**-Umbilicus
16. **T9**-Area between T8 & T10
17. **T12**-Pubis (Above the Inguinal ligament)
18. **T11**-Area between T10 & T12
19. **L1**-Over the Inguinal ligament
20. **L2**-Below the inguinal ligament
21. **L3**-Lower medial side above the Knee
22. **L4**-Medial aspect of leg, Great toe(Dorsal, Ventral & Medial aspect)
23. **L5**-Lateral aspect of leg (Runs diagonally from outer aspect of tibia to the inner aspect of the foot), **Dorsum of the foot** (Excluding a smaal area on the lateral aspect)
24. **S1**-**Little toe** (Dorsal, Vntral & Lateral aspect), Achilles tendon & strip of skin above it. We walk on S1.
25. **S2**-Back of the thigh & Leg (Calf muscles & **hamstrings)**
26. **S3**-Skin over the gluteal fold
27. **S4 & S5**-Perineum (Perianal region)

>A dermatome is a band of skin innervated by the sensory root of a single spinal nerve.

A.SUPERFICIAL SENSATION

1.TOUCH (LIGHT TOUCH)

>Touch is abolished/ Reduced/ Mislocalised/ Misperceived-Painful/ Irritation/ Tingling sensation

>Pt **closes his eyes** & responds verbally to each touch. Stimulate the skin with single very gentle touches of a wisp of cotton (or tip of your index finger or a fine camel hair brush) **dermatomewise** & avoid regular timed stimuli. Compare the sensation in each limb for symmetry i.e to know wheather the sensory

loss is symmetric or asymmetric. Outline the borders of any abnormal area of sensation by testing from the hypoaesthetic area towards normal. Examine the spinal segments sequentially.
>Fine touch is tested by a small piece of cotton wool which is twisted into a fine hair while crude touch is tested by the tip of rt index finger (or the wider side of the cotton wool). You can also test fine touch by using monofilaments.
>In general it is better to avoid testing touch sensation on hairy skin because of the abundance of sensory nerve endings that surround each hair follicle.
>**CRUDE TOUCH** –A sensation perceived as light touch but without accurate localizations.
>**FINE TOUCH** –Touch i.e accurately localized & finely discriminating.

2.PAIN

a.SUPERFICIAL PAIN

-Intact/ Impaired/ Lost

A series of pin prick of uniform intensity (avoid heavy pressure) is given dermatomewise. Pt is asked to tell if he feels the same or not when two areas are stimulated. Always test from an area of abnormality towards normal skin. Select the presternal area for baseline sharpness before testing a limb. Ask wheather the quality of sensation becomes sharper or painful (hyperaesthesia) or feels blunter (hypoaesthesia). The pt is asked to focus on the pricking or the unpleasant quality of the stimulus & not just the pressure or touch sensation elicited by the pin prick. Areas of hypoalgesia should be mapped by proceeding radially from the most hypoalgesic site.

b.DEEP PAIN

-Intact/ Impaired/ Lost

Tested by pinching the Achilles tendon.

3.THERMAL SENSATION

-Intact/ Impaired/ Lost

1. Tests for cold
2. Tests for hot

Glass or copper testubes containing hot (44 C) & cold (30 C) water are touched to the skin in a random manner so as to avoid guessing by the pt (A rough assessment of temperature sensation can be assessed by touching the tuning fork or bell of the stethoscope for cold & rubbing the palms for hot.)

B.DEEP SENSATION

PRIMARY MODALITIES OF SENSATION (TOUCH, PAIN & TEMPERATURE) MUST BE INTACT BEFORE TESTING FOR DEEP SENSATION.

1.VIBRATION SENSE (DORSAL COLUMN)

a.Lost-Proximally/ Distally/ Lost over tibial tuberosity or styloid process of radius etc.

b.Impaired-Proximally/ Distally

Ask the pt to close his eyes. Place the foot of a vibrating tuning fork of **128Hz (Never use 256 Hz)** sequentially over the tip of big toe, lateral mlleolus or medial malleolus, shin of tibia, tibial tuberosity & anterior superior iliac spine for lower limb & over knuckles, styloid process of radius, olecranon process, shoulder tip for upper limb & over ribs or costal margin, sternum, clavicles & vertebral spines for trunk. Ask the pt when he ceases to feel it. If the examiner still can perceive it at the same site as in the pt, then the pt's perception of vibration is impaired. From time to time place the non-vibrating fork to avoid rt from guessing. Always compare with the other sides. Control sites-Place the tuning fork over the pt's sternum & forehead. Vibratory thresholds at he same site in the pt & in the examiner are compared for the control purposes. Vibratory thresholds at the same site in the pt & in the examiner is compared for control purposes.

>The rule goes like this-**IF THE DISTAL VIBRATION SENSATION PERSISTS, IT IS USELESS TO EXAMINE THE PROXIMAL PARTS, BUT IN CASE OF LOSS OF DISTAL SENSATION, ALWAYS MOVE PROXIMALLY IN TURN.**
>128 Hz tuning fork decays 15 to 20 seconds later compared to 512 Hz & hence is preferred over 512 Hz tuning fork.

2.SENSE OF PASSIVE MOVEMENT (DORSAL COLUMN)

-Intact/ Impaired/ Lost

>Tested in-
a.Upper limb-Terminal interphalangeal joint of thumb & index finger
b.Lower limb-Interphalangeal joint of big toe.

It is essential that the pt should be relaxed sufficiently to allow the digit to be moved passively. Show the pt the intended movemets of the joint & name them up & down. Now, grasp the terminal phalanx on its lateral & medial side at its interphalangeal joint (not on its dorsal & ventral aspect) with the thumb & index finger of your rt hand. Move the terminal phalanx up & down not exceeding **10^0 to 15^0**, a number of times, finally leaving it in some definite position & the pt is asked to say the direction i.e UP or DOWN in which the phalanx is moved with eye closed. **TAKE CARE TO ENSURE THAT EXAMINER'S FINGER DOESN'T RUB AGAINST THE PATIENT'S OTHER FINGERS.** Movements of less than 10 degrees can be appreciated at all normal joints. At least four wrong answers should be received before concluding that joint sensation is impaired or lost & then it is performed at wrist, elbow, ankle, knee joint i.e proximal joints in sequence. **IT MUST BE EMPHASIZED THAT NO OTHER PARTS OF THE EXAMINER'S BODY EXCEPT THE LEFT INDEX FINGER & THE LEFT THUMB SHOULD BE IN CONTACT WITH THE PATIENT'S BODY.**

3.JOINT POSITION SENSE (DORSAL COLUMN)

Pt **closes his eyes** & the joint in a limb to be tested is put in a particular position. Then pt is asked to hold the other limb in a similar position.

4.CORTICAL SENSATION

PREREQUISITE

PRIMARY MODALITIES OF SENSATION SHOULD BE INTACT PRIOR TO TESTING FOR CORTICAL SENSATION. If primary modalities of sensation are absent, we can not test cortical sensations. Or in otherwords, testing cortical sensations are meaningful only when primary sensations are intact because cortical sensations mediated by the parietal lobes represent an integration of the primary sensory modalities. Five primary sensory modalities include- Light touch, pain, temperature, vibration & joint position sense.

>Double simultaneous stimulation is especially useful as a screening test for cortical function-With the pt's eye closed, the examiner lightly touches one or both hands & asks the pt to identify the stimuli. With parietal lobe lesion, the pt may be unable to identify the stimulus on the contralateral side when both hands are touched.
>Always compare with the other side.

a.TACTILE LOCALIZATION (=TOUCH LOCALIZATION)

-Intact/ Impaired/ Lost

>Ask the pt to **close his eyes** & to localize the tactile stimuli applied by wisp of a cotton or tip of examiner's right index finger to various parts of the body-Hand, fingers, face etc. with his fingertip.
>Ask the pt to discriminate right from left & which finger is touched. Ability to localize the touched point is more precise at periphery than proximally.

b.TACTILE DISCRIMINATION (=TWO-POINT DISCRIMINATION)

-Intact/ Impaired/ Lost

>Pt **closes his eyes**. Two points of a blunt divider touched simultaneously on the pulp of fingers & toes & the pt is asked wheather he is touched with one or two points. Determine the minimum distance at which pt can feel two points.

>Normally, two points separated by a distance of **3 mm (3-5 mm**) on the finger pulps & lips, **2-3 cm** on the **palm**, **1cm** on the **pulp of toes**, **4 cm** on the **sole of the foot**, **5 cm** and above on the **dorsum of the foot**, **5 cm** and above on the **legs** & **3-5cm** on **any part of trunk** are recognized as two separate points.
>If two-point discrimination is lost in the presence of intact posterior coloumn sensations, then it indicates parietal lobe lesion.

c.STEREOGNOSIS

-Intact/ Impaired/ Lost

Pt **closes his eyes**. Ask the pt to identify a coin (or other familiar objects) placed in his palm by feel alone. Recognition of size, shape, weight & form of a common object & identification of it by touch alone is known as stereognosis. Pt's failure to identify the common objects by this method is known as astereognosis.

d.GRAPHAESTHESIA

-Intact/ Impaired/ Lost

Pt **closes his eyes**. Write a letter or a digit with a blunt object (or with your index finger) on palm (back, thigh, anterior forearm) & ask the pt to identify the letter or the digit. The accuracy & speed with which the letter or the digits are identified are compared for two palms. Clear figures like 8, 4 & 5 should be used. More difficult figures like 6, 9 & 3 are used as finer tests.

e.SENSORY INATTENTION/TACTILE INATTENTION (=BILATERAL SIMULTANEOUS STIMULATION)

-Intact/ Impaired/ Lost

Pt **closes his eyes** & outstretches his arms. Touch identical points of both hands simultaneously & the pt is asked whether he is touched on rt or lt or both sides. In unilateral parietal lobe lesion, the sensation on the opposite side is not perceived by the pt (or identical points on two sides of the body are pricked with a pin separately with eye remaining closed. If the pt can identify the pin prick in both situations, the previous points are now pricked simultaneously.)

C.DEFINITE LINE OF SENSORY LOSS ON TRUNK

*Sensory functions are normal.

D.VISCERAL/SPHINCTERIC REFLEX

1.MICTURITION REFLEX

-Intact/ Lost

Pt is asked about bladder & urethral sensation, retention, incontinence, urgency, hesitancy or difficulty in controlling or initiating micturition.

2.DEFECATION REFLEX

-Intact/ Lost

Pt is asked about rectal sensation & incontinence of feces. The reflex action of the anal sphincter can be tested by introducing gloved & lubricated (Xylocaine jelly) rt index finger into the anus & noting wheather contraction of the sphincter occurs with the normal force or it is weak or paralysed or wheather any spasm is excited. The activity of the reflex may also be tested by demonstrating anal reflex.

V.ANCILLARY EXAMINATION

Test both in rt & lt sides.

A.SIGNS OF MENINGEAL IRRITATION

1.KERNIG'S SIGN

-Positive-rt or lt / Negative-rt or lt

Pt is in supine position. Fully flex the thigh (Hip joint) on the abdomen & then extends the knee joint. Look to pt's face for pain & feel for the spasm of hamstrings resisting extension of knee joint in a positive case.

>The test is positive in meningeal irritation affecting lower part of the spinal subarachnoid space.

2.BRUDZINSKI'S SIGN

It is a very helpful sign of meningeal irritation in children. It has following 2 components-

a.BRUDZINSKI'S LEG SIGN

-Positive-rt or lt / Negative-rt or lt

Pt is in supine position with extended legs. Passive flexion of knee & hip of one lower limb causes similar flexion of the other lower limb not touched. It indicates extreme degree of meningeal irritation. Usually, we do not get Brudzinski's leg sign. This sign is present when there is an extreme degree of meningeal irritation involving the lower part of the spinal cord.

b.BRUDZINSKI'S NECK SIGN

-Positive-rt or lt / Negative-rt or lt
Pt is in supine position with extended legs. Try to lift the pt's head from the bed by placing your palm on the occiput. There will be reflex flexion of hip or knee of one or both the lower limbs in a positive case.

3.NECK RIGIDITY/ NECK STIFFNESS

-Present/ Absent

Pt is in supine position. **Remove the pillow if present**. Stand on the rt side of the bed & place your lt palm below the pt's head & rt palm horizontally on the front of the chest over the upper part of sternum. Try to lift the head from the bed & flex it several times in an attempt to touch the chest with the chin. Feel for the resistance while flexing & look for the facial grimacing due to pain. (In sitting position of the pt, ask him to touch the chest with the chin with closed mouth). **NECK STIFFNESS IS A MORE SENSITIVE TEST THAN KERNIG'S SIGN.**

4.BICKEL'S SIGN

-Positive-rt or lt / Negative-rt or lt

Extension of the shoulder causes pain when carried out with the elbow extended.

>All the aforementioned tests of meningeal irritation are positive in inflammatory conditions of meninges like **MENINGITIS, MENINGISM & SUBARACHNOID HEMORRH-AGE**. This is also seen in pts with raised intracranial pressure in whom the herniation of the cerebellar tonsils into the foramen magnum has begun.

B.TESTS FOR NERVE ROOT ENTRAPMENT

1.STRAIGHT LEG RAISING (SLR) TEST

- Positive/ Negative

Pt is in supine position. Stand on the rt side of the pt & place your lt palm on the patella of extended knee joint. Place your rt palm below the heel & raise the lower limb straight upwards with extended knee & look to pt's face for pain (Facial grimacing). When the pt feels pain, lower the leg till the pt becomes comfortable. Now keeping the knee joint extended with the right palm placed below the heel, dorsiflex the foot with your lt hand. If there is **sacroilitis**, pt winces with pain. The test is positive i.e restricted movement with pain is present in **sciatica & prolapsed intervertebral disc.**

>Movement upto 90^0 is possible in a normal person.
>***LASEGUE'S SIGN=POSITIVE SLR TEST***
>A positive SLR test at $\leq 40^0$ suggests root compression (due to prolapse of intervertebral disc).

VI.CEREBELLAR FUNCTION

>Test in both sides-Right & left.

1.PENDULAR KNEE JERK

-Present/ Absent

The pt will sit on a chair with legs hanging free side by side. Apply a sharp tap on the patellar tendon on each side, one after another. Contraction of the quadriceps with extension of the knee occurs. In case of cerebellar lesion the movements become pendular in nature i.e the first movement is followed by a series of diminishing oscillations before finally coming to rest. According to some, three to-and-fro movements in the leg are known as pendular. If no response occurs, perform the **JENDRASSIK'S MANEUVER**. Pendular knee jerk is due to hypotonia.

2.INTENTION TREMOR

-Present/ Absent

The pt is asked to hold a glass of water kept on the table or perform finger nose test. Observe the movement which becomes clumsy before he holds the glass of water or touches his nose. This tremor appears at the goal point of an action & is absent at rest & in the beginning of any movement. This tremor is **COARSE (4-5/SECOND**) in nature.

3.FINGER-NOSE TEST

-Normal/ Abnormal
As mentioned above.

4.DYSDIADOCHOKINESIA

-Normal/ Abnormal
As mentioned above.

5.NYSTAGMUS

-Present/ Absent

Horizontal jerky nystagmus is present & the direction of nystagmus is towards the side of lesion

6.REELING GAIT

-Present/ Absent

1. Ask the pt to walk along a straight line. The pt walks on a broad base, the feet being placed widely apart & irregularly. The pt sways & often falls towards the side of lesion during walking. At times, the head is tilted towards the side of the lesion.

2.Then test for tandem gait as mentioned above. It is very difficult for a pt with cerebellar lesion to walk steadily by tandem gait. This gait is a sensitive test for early ataxia.

7.HYPOTONIA

-Present/ Absent

Elicit the tone of the muscle & it will be flaccid both at rest & during passive movement of the parts.

8.TITUBATION

-Present/ Absent

Nodding of the head. Sometimes there is head tilt.

9.SCANNING SPEECH

-Present/ Absent

There is dysarthria of scanning type. The speech is usually slow, slurred & irregular. Often the pt scans the speech i.e he speaks syllable by syllable. Ask him to say artillery: he will pronounce it as ar-til-ler-y.

10.DYSMETRIA

-Present/ Absent

It means inability to arrest the movements at desired point & is elicited by finger-nose test as mentioned above. In cerebellar lesion, the index finger of the pt may fall short (i.e hypometria) or overshoot (i.e hypermetria or past pointing) his nose.

11.REBOUND PHENOMENON

-Present/ Absent

The limb overshoots beyond the normal range after sudden release of the resistance. Ask the pt to flex his elbow against the resistance offered by the examiner. As soon as you withdraw the resistance suddenly, the pt's hand tends to strike his face (because the antagonistic muscle like the triceps can not contract promptly. This phenomenon is due to muscular hypotonia.

12.DYSSYNERGIA

-Present/ Absent

Often the movements may be broken down into their component parts (Decomposition of movements) producing small, jerky & clumsy movements (like the modern break dance). The pt feels difficulty in performing the complex movements.

VII.SKULL & SPINE

1.EXAMINATION OF SKULL

-Normal/ Any deformity

The entire scalp should be firmly palpated for bony defects or abnormal protuberances. Painful points may be present with vascular or muscle tension headache. A **CRACKED POT** sound may be heard on percussion in fracture of skull & in internal hydrocephalus. The presence of a bruit on auscultation is suggestive of intracranial aneurysm or angioma.

2.EXAMINATION OF SPINE

a.Kyphosis / Scoliosis / Kyphoscoliosis/ Spina bifida/ Gibbus (Localised bulging) / Angulation / Scar (Old trauma)

b.Localised tenderness

Tenderness of spine is elicited by pressing on the thumb moving from above downwards or stroking with the pointed end of the knee hammer moving from above downwards.

c.Swelling in paraspinal area

>**One must examine spine in all neurological cases specially when dealing with paraplegia.**

SOME IMPORTANT LANDMARKS

1.Spine of scapula corresponds to T3
2.Inferior angle of scapula corresponds to T 7 (Inferior angle of scapula usually lies at the level of the 7th rib or 7th ICS posteriorly).
3.Highest point of iliac crest corresponds to upper border of L4 (4th lumbar vertebra).
4.Ask the pt to bend his neck forward. The most prominent & easily palpable spinous process in cervical area is the spinous process of 7th cervical vertebra (C7).
5.Median angle of the scapula lies at the level of the disc between the 1st & 2nd thoracic vertebra & just covers the 2nd rib.
6.The roots of the lung lie in the interscapular region opposite to the spines of the 4th, 5th & 6th thoracic vertebrae.

>These important landmarks are utilized to determine the level of the spinal cord lesion from the corresponding vertebral level.

DETERMINATION OF SPINAL CORD SEGMENT RELATED TO A GIVEN VERTEBRAL BODY

1.For **CERVICAL** vertebrae-add 1 level
2.For **THORACIC** vertebrae **T1 to T6**-add **2** levels
3.For **THORACIC** vertebrae **T7 to T9**-add **3** levels
4.The **TENTH THORACIC** arch overlies lumbar L1 & L2 segments
5.The **ELEVENTH THORACIC ARCH** overlies lumbar 3 & 4 segments
6.The **TWELFTH THORACIC ARCH** overlies lumbar 5 segments
7.The **FIRST LUMBAR ARCH** overlies the sacral & coccygeal segments

>**IN THE LOWER THORACIC REGION, THE TIP OF A SPINOUS PROCESS MARKS THE LEVEL OF THE BODY OF THE VERTEBRA BELOW.**

>Determination of spinal cord segments related to a given vertebral body is required because of the disproportionate growth in length of the vertebral column as compaired to spinal cord during development so that the spinal cord remains much smaller than the vertebral canal.

5.EXMINATION OF AN UNCONSCIOUS PATIENT

>Determination of side of hemiplegia in an unconscious patient-

A.Away from the paralysed side-Conjugate deviation of the eyes.

B.On the hemiplegic side-

- Cheeks puffs out during respiration
- Nasolabial fold is obliterated
- Coneal reflex diminished
- Pain stimulation is less effective
- More absolute flaccidity of limbs(drooping tests)
- Paralysed leg extended & assumes a position of external rotation while the healthy one tends to be semiflexed
- Pupil is large on the side of the hemorrhage
- Eyelid release test-Eyelid slides down slowly after both the eyelids are pulled up & released simultaneously
- Temperature of paralysed side is usually higher

>Eye deviation away from the side of the hemiparesis is common with recent infarction in the middle cerebral artery territory.Eyes are deviated to the side of the hemiplegia suggests pontine lesion

GENITOURINARY SYSTEM EXAMINATION

I.INSPECTION

1.GENITALIA

-Penile swelling/ Vulval edema/ Scrotal swelling/ Contact ulcer

II.PALPATION

1.KIDNEY

2.RENAL ANGLE TENDERNESS

- Present / Absent

The pt sits up & holds his arms in front so that the back is stretched enough for better palpation. Now the examiner presses his thumb on the renal angle formed by the lower border of the 12th rib & outer border of erecter spinae. Look to pt's face for pain (i.e facial grimacing).

3.FLUID THRILL

4.PARIETAL EDEMA

5.EXAMINATION OF GENITALIA-for scrotal edema, hydrocele, phimosis, contact ulcer in genitalia, palpation of testis etc.

III.PERCUSSION

1.SHIFTING DULLNESS

2.UPPER BORDER OF LIVER DULLNESS

3.BAND OF COLONIC RESONANCE OVER THE RENAL MASS

4.PERCUSSION OF THE URINARY BLADDER

IV.AUSCULTATION

1.RENAL ARTERY BRUIT

2.VENOUS HUM

LYMPHORETICULAR SYSTEM EXAMINATION

CLASSIFICATION OF NECK NODES ACCORDIMG TO LEVELS

LYMPH NODE LEVEL	LYMPH NODE SITE
LEVEL I	**IA**- Submental Nodes
	IB- Submandibular Nodes
LEVEL-II	Upper Jugular Nodes
LEVEL-III	Middle Jugular Nodes
LEVEL-IV	Lower Jugular Nodes
LEVEL-V	Accessory Nerve Nodes Supraclavicular Nodes Suboccipital Nodes Parotid Nodes
LEVEL-VI	Prelaryngeal Nodes Pretracheal Nodes Paratracheal Nodes
LEVEL-VII	Nodes of Upper Mediastinum

I.INSPECTION

1.LYMPH NODE ENLARGEMENT

1. Site
2. Number
3. Size
4. Shape
5. Extent
6. Margin
7. Surface
8. Discharge
9. Skin over the swelling

2.CONDITION OF SKIN

-Scar mark/ Scratch mark/ Yellow discolouration/ Ulcer/ Ecchymosis/ Scaly/ Puncture mark/ Shiny

3.CONDITION OF GUM

4.CONDITION OF MUCOUS MEMBRANE

5.HEMORRHAGIC SPOTS IN SKIN

1. Petechiae(1-2 mm in size i.e pin-head-size)
2. Purpura (2-5 mm in size)
3. Ecchymoses=Bruises (Larger purpuric lesions)
4. Suggillation (> 20 mm in size)
5. Haematoma (Large hemorrhages in the skin with surface elevation)

II.PALPATION

1.LYMPH NODE ENLARGEMENT

1. Site
2. Temperature
3. Tenderness
4. Number
5. Size
6. Shape
7. Extent
8. Surface
9. Margin-Discrete/Confluent
10. Consistency (Palmar aspect of three fingers)-Soft/ Elastic & rubbery/ Firm, discrete & shotty/ Stony hard/ Variable/ Hard/ Discrete
11. Mobility-Movable/ Fixed
12. Fixity to surrounding skin-Yes/ No
13. Matting-Present/ Absent
14. Examination of draining LNs
15. Examination of LNs in other parts of body

METHOD OF LYMPH NODE PALPATION

1. Nodes are palpated symmetrically on both sides of the body from above downwards.
2. Enlarged lymph nodes should be carefully palpated with the **PALMAR ASPECTS OF THE MIDDLE 3 FINGERS OF BOTH HAND** by rolling the pulp of the fingers against the swellings while maintaining slight pressure to know the actual consistency of the swelling.
3. **NECK LYMPH NODES**

These nodes are always palpated from behind in sitting position of the pt with the pt's head bending forward (to relax the muscles in the anterior part of the neck. If one side of the neck is palpated at a time, the neck should be flexed to that side (i.e lateral flexion of the neck to that side).

A.CERVICAL NODES

1.UPPER CIRCULAR GROUP

These neck nodes are palpated symmetrically by both hands (i.e using right hand rt Side & lt hand for lt side) in the following order from front to back:-

1. Submental
2. Submandibular
3. Tonsillar
4. Preauricular
5. Postauricular
6. Occipital

2.LATERAL CERVICAL NODES

Upper, middle & lower jugular nodes are palpated with the palmar aspects of the middle 3 fingers at the anterior border of sternomastoid which may need to be displaced posteriorly. The nodes in the posterior triangle (i.e spinal accessory & transverse cervical nodes) are palpated with the palmar aspects of the middle 3 fingers at the posterior border of sternomastoid.

3.ANTERIOR CERVICAL NODES

Method of palpation of these nodes is usually not asked.

4.LOWER HORIZONTAL GROUP

Includes scalene & supraclavicular nodes. For palpation of scalene nodes, stand behind the pt. Ask the pt to flex the neck towards the side (i.e to rt Or lt) under examination. Examine for the scalene nodes by dipping the palpating index finger behind the clavicle through the clavicular head of the sternomastoid.

>Neck nodes are examined in the following sequence so that none is missed-

1. Upper horizontal chain-Examine Submental, Subma-ndibular, Tonsillar, Preauricular, Postauricular, Occi-pital nodes.
2. External jugular chain-Lies superficial to sternomas-toid.
3. Internal jugular chain-Examine the upper, middle & lower jugular nodes.
4. Spinal accessory chain
5. Transverse cervical chain
6. Anterior jugular chain
7. Juxtavisceral chain-Examine prelaryngeal, pretrach-eal & paratracheal nodes.

B.AXILLARY NODES

1.PECTORAL GROUP (=ANTERIOR GROUP)

This group is situated just behind the anterior axillary fold. Pt sits on a stool & the examiner sits in front of the pt. The pt's arm is elevated & using the rt hand for the lt side. Then fingers are insinuated behind the pectoralis major. The arm is now lowered & made to rest on the examiner's forearm. With the pulp of the fingers, try to palpate the nodes. The palm should look forward. The thumb of the same hand is used to push the pectoralis major backwards from front so that nodes are palpated between thumb & other fingers. Use the lt hand for the rt side.

2.BRACHIAL GROUP (=LATERAL GROUP=HUMERAL GROUP)

This group lies on the lateral wall of the axilla. Pt.' sits on a stool & the examiner sits in front of the pt.. Here Lt. hand is used for Lt. side & Rt. hand is used for Rt. side. The nodes are palpated with the examiner's palm directed laterally against the upper part of the humerus.

3.SUBSCAPULAR GROUP (=POSTERIOR GROUP)

These nodes lie in the posterior axillary fold & are best palpated from behind. Here lt hand is used for lt side & rt hand is used for rt side. Pt sits on a stool. Standing behind the pt, the examiner palpates the antero-internal surface of the posterior axillary fold while with the other hand the pt's arm is kept horizontally forward with flexion at the elbow. Now the nodes are palpated lying on this surface with the palm of the examining hand looking backwards between thumb (at the back) & other finger (in front).

4.CENTRAL GROUP

This group of lt side is palpated by rt hand & rt side by lt hand. Pt sits on a stool & the examiner sits in front of the pt. At first the pt's arm is slightly abducted & the extended fingers of the examiner's hand are placed in the axilla in such a way that the palm is directed towards the chest. The pt's arm is now brought to the side of her body & the forearm rests comfortably on the clinicians forearm. The other hand of the examiner is placed over the pt's same

shoulder. Palpation is carried out by sliding the fingers upwards against the chest wall to reach the highest limit of the axilla when the enlarged nodes are felt slipping out from the fingers.

5.APICAL GROUP (=INFRACLAVICULAR GROUP)

The same method as described in central group is applied here, but the fingers are pushed as high as possible. If these nodes are very much enlarged, they may push themselves through the clavipectoral fascia to be felt through the pectoralis major just below the clavicle.

C.EPITROCHLEAR NODES

Pt sits on a stool & the examiner stands in front of the pt. Make the pt's elbow slightly flexed & forearm supinated while supporting the pt's rt wrist with the examiner's lt hand & similarly pt's lt wrist with the examiner's rt hand. Now the pt's lt elbow is grasped by the examiner's lt hand & the pt's rt elbow is grasped by the examiner's rt hand. Now the nodes are palpated under the thumb in the anteromedial region of lower part of the arm in between the groove of biceps & brachioradialis muscle adjacent to the elbow. Both the sides should be examined one after another.

D.MEDIASTINAL NODES

Detected indirectly by percussion over the sternum. Normally resonant note is obtained on percussing over the sternum.

E.PARA-AORTIC NODES

Pt is in supine position. Pre-requisites are same as described in abdominal palpation. In majority of the cases, abdominal lymph node lumps are found in epigastrium, umbilical area & rt iliac fossa, but these nodes may be present anywhere in the abdomen. These nodes show no movements with respiration & there is no mobility.

F.INGUINAL NODES

Pt is in supine position & thigh is extended. Palpate one after another over the horizontal chain, which lies just below the inguinal ligament & then palpate over the vertical chain along the saphenous vein. Palpate both the sides.

G.POPLITEAL NODES

Pt lies in supine position with the knee flexed to less than 45 degree. These nodes are palpated with the fingertips of both the examiner's hands by curling the fingers into the popliteal fossa one after another as in palpation of pulses in popliteal artery.

CONCLUSION

1. Palpate all the anatomical areas for lymph node enlargement.
2. In a pt with lymphadenopathy, examine Waldeyer's ring, breast, testis, non-pitting edema in legs, sternal tenderness, hepatosplenomegaly, ascites, pleural effusion, tenderness in spine (paraplegia in a case of lymphoma) & cranial nerves.
3. All the system should be examined.
4. In a pt with inguinal lymphadenopathy, examine the legs & sole of the foot for the presence of any ulcer, infection etc.
5. A case of lymphoma may be given as superior mediastinal syndrome.
6. No local examination is complete without the examination of the lymph nodes draining the affected area.

2.LIVER

1. Tenderness-Tender/ Nontender
2. Palpable___cm/___fingers below the costal margin at rt mid-clavicular line (Measurement taken during normal expiration)
3. Margin-Sharp (palm leaf)/ Rounded/ Irregular
4. Consistency-Soft/ Firm/ Hard
5. Surface-Smooth/ Irregular/ Nodular
6. Moves with respiration
7. Left lobe-Enlarged/ Not enlarged
8. Upper border of liver dullness-Starts from rt ___ ICS at MCL
9. Any pulsatin-Felt/ Not felt

3.SPLEEN

1. Tenderness-Tender/ Nontender
2. Palpable___cm below the costal margin in rt MCL
3. Consistency-Soft/ Firm/ Hard
4. Notch-Felt/ Not felt
5. Surface-Smooth/ Nodular
6. Moves with respiration-Yes/ No
7. Inability to insinuate the fingers between the mass & the costal margin

4.STERNAL TENDERNES

-Present/ Absent
Flex your fingers to make a C shaped curve & then tap the middle of the sternum with the tip of the fingers (forming C shaped curve) 1 to 2 times. In the presence of sternal tenderness, the pt winces with pain or complains of pain OR look to the face for facial grimacing.

5.TENDERNESS IN THE OTHER BONES

-Present/ Absent
When sternal tenderness is present, examine the pt for tenderness in other bones like-Pelvic bones, long bones (press the upper part of shin bone-the anterior edge of the tibia i.e the portion of the leg between the ankle & knee) & frontal bone (press the forehead).

PERCUSSION

1.PERCUSSION OF STERNUM

-Tympanic/ Dull
Flex your fingers to make a C shaped curve & then tap the middle of the sternum with the tip of the fingers (forming C shaped curve) 1 to 2 times. In the presence of sternal tenderness, the Pt winces with pain or complains of pain OR look to the face for facial grimacing.

AUSCULTATION

1.D' ESPINE'S SIGN

Normally whispered voice sounds (Whispering pectoriloquy) are well audible over the spines of the lower cervical vertebrae in infancy & childhood & below the 3rd thoracic vertebrae in adults. When whispering pectoriloquy is audible below these levels, D' Espine's sign is said to be positive which is found in Enlarged mediastinal lymph nodes (at the bifurcation of trachea) or tracheobronchial lymph nodes in lymphoma, mass in bronchogenic carcinoma, posterior mediastinal tumors & central pneumonia.

LOCOMOTOR SYSTEM EXAMINATION (OPTIONAL)

I.INSPECTION

1.MONO/ PAUCI/ POLY ARTICULAR INVOLVEMENT

2.ATTITUDE OF THE LIMB

3.SWELLING

4.DEFORMITY

5.SIGNS OF INFLAMMATION OVER THE INVOLVED JOINT

6.WASTING OF MUSCLES

7.SKIN CHANGES

II.PALPATION

1.TEMPERATURE OF THE LOCAL PART

2.TENDERNESS

3.ANY SWELLING

-Fluctuant/ Non fluctuant

4.MUSCLE POWER

5.CORROBORATION OF THE FINDINGS OF INSPECTION

III.MOVEMENTS

1.RESTRICTED MOVEMENT/ EXCESSIVE MOBILITY

2.ANY PAIN ON MOVEMENT

3.CREPITUS OR GRATING SENSATION ON MOVEMENT

4.ANY ASSOCIATED MUSCULAR SPASM

IV.MEASUREMENT

1.LENGTH & CIRCUMFERENCE OF THE LIMB

2.MEASUREMENT IN RELATION TO VARIUS BONY POINTS

V.EXAMINATION OF SPINE

1.TENDERNESS

2.MOBILITY

3.KYPHOSCOLIOSIS

4.GIBBUS

VI.GAIT

J.DIFFERENTIAL DIAGNOSIS

|DISEASE| |POINTS IN FAVOUR| |POINTS IN AGAINST|

K.PROVISIONAL DIAGNOSIS

L.SUMMARY

*Write only the history & positive findings